Final Workplan

Site 9 Ash Landfill/Dump Removal Action
NAS Brunswick, ME

N62472-05-Q-SB22

Submitted to:
NAVAL FACILITIES ENGINEERING COMMAND
EFA NORTHEAST
10 INDUSTRIAL HIGHWAY

Submitted By:

oak environmental consultants, Inc.
Greentree Mews
800 North Route 73, Suite 12
Marlton, NJ 08053

oak
environmental
consultants, inc.

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- G-2 EPA Comments Dated July 25, 2005
- G-3 MEDEP Comments Dated September 13, 2005
- G-4 Navy Comments Dated July 14, 2005

List of Acronyms

ACM – Asbestos Containing Materials
AWQC – Ambient Water Quality Criteria
BMP – Best Management Practices
BNAS – Brunswick Naval Air Station
CERCLA – Comprehensive Environmental Response Compensation and Liability Act
DRO – diesel range organics
EPA – U.S. Environmental Protection Agency
GRO – gasoline range organics
MEDEP – Maine Department of Environmental Protection
MEGs – Maine Maximum Exposure Guidelines
NAS – Naval Air Station
NFESC – Naval Facilities Engineering Service Center
OSHA – Occupational Safety and Health Administration
PCBs – polychlorinated biphenyls
PPE – personal protective equipment
PRGs – preliminary remediation goals
QA/QC – quality assurance/quality control
QAPP – Quality Assurance Program Plan
RAGs – remedial action guidelines
RCRA – Resource Conservation and Recovery Act
ROICC – Resident Officer In Charge of Construction
SHSP – Site Health and Safety Plan
SSLs – soil screening levels
SVOCs – semi-volatile organic compounds
T&D – transportation and disposal
TCLP – toxicity characteristic leaching procedure
TPH – total petroleum hydrocarbons
UXO – unexploded ordnance
VOCs – volatile organic compounds

Project Contact List

Engineering Field Activity Northeast (EFANE)
10 Indusrial HWY., MSC #82
Lester, PA 19113-2090
Code EV4/CG
ATTN: Mr. Claude Graff, Contract Specialist
(610) 595-0631

Engineering Field Activity Northeast (EFANE)
10 Indusrial HWY., MSC #82
Lester, PA 19113-2090
Code EV4/FJC
ATTN: Frank Cellucci, Project Lead (PL)
(610) 595-0567, x122

Engineering Field Activity Northeast
10 Indusrial HWY., MSC #82
Lester, PA 19113-2090
Code 182/LM
ATTN: Mr. Lonnie J. Monaco, P.E., Remedial Project Manager (RPM)

Resident Officer in Charge of Construction (ROICC)
Naval Air Station
437 Huey Drive
Brunswick, ME 04011-5000
ATTN: Jim Toal
(207) 921-2315

Naval Air Station, Environmental Office
437 Huey Drive
Brunswick, ME 04011-5000
ATTN: Ms. Lisa Joy
(207) 921-1717

Ms. Claudia B. Sait
Division of Remediation
Bureau of Remediation & Waste Management
Maine Department of Environmental Protection
17 State House, Station
Augusta, ME 04333
(207) 287-7713

Ms. Christine Williams
EPA - New England (Region 1)
1 Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023
(617) 918-1384

Ms. Carolyn Lepage
Lepage Environmental Services, Inc.
731 Hotel Road (FedEx)
Auburn, ME 04210
(207) 777-1049

P.O. Box 1195 (Regular Mail)
Auburn, ME 04211-1195

1.0 BACKGROUND

NAS Brunswick is an active base, owned and operated by the Federal government through the Department of the Navy. NAS Brunswick is located in Brunswick, Cumberland County, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123.

Site 9 is approximately 20 acres in area and is located in the central portion of the base (Figure 1). The CERCLA Information System operable unit number assigned to Site 9 is OU6. Records indicate that a former incinerator, ash landfill/dump area, and disposal area are located at Site 9. The incinerator was reportedly used from April 1943 until the Fall of 1946, but may have been used as late as 1953 when the barracks buildings were constructed. Solid wastes were incinerated and the ash was disposed of in the dump (now referred to as the ash landfill/dump area), and other wastes disposed of into the dump reportedly included solvents which were burned on the ground, paint sludge, and possibly wastes from the metal shop (U.S. Navy 1994 [PRAP]).

Site 9 has been characterized in the Draft Final Direct-Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report For Site 9, Naval Air Station Brunswick, Maine of November 2004.

Surrounding land use is residential/commercial; former barracks and related buildings adjacent to the area have been recently demolished. Site 9 is generally flat with two steep-sided stream channels in the southern portion of the site. Avenue C "Neptune Drive" divides the site on a west-east axis, and Orion Street borders the western edge of Site 9.

Impoundment ponds were constructed in 1997 and receive surface drainage from the majority of the operations (industrial) area of the base, including the flight line and hangar areas. The impoundment ponds are located to the south, southeast, and east of Building 201 (a dining facility).

2.0 STATEMENT OF WORK

The objective of the removal action is to removal all ash and debris from the Site 9 Ash Landfill/Debris Dump as identified in the draft Direct Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9 (EA 2004) and as depicted on Figure 2. Confirmation sampling will be performed after all visible ash and debris has been removed to ensure that cleanup standards have been achieved for unrestricted used.

This Work Plan outlines the procedures for excavation and off-site disposal of approximately 16,000 cubic yards of ash, debris and co-mingled soils. Waste sampling shall be performed as required to satisfy all Base, Federal, state and local law, ordnances and environmental regulations and waste material receiving facilities. The removal area will be backfilled, graded and seeded. Erosion controls shall be designed and constructed to comply with MEDEP throughout the period of performance for this contract.

The work also includes the following: removal of concrete debris at the surface consisting of 4 inch to 8 inch pieces of concrete remaining from the recently completed building pad demolition (former Buildings 217 through 220), removal of the foundation walls and footings of the former buildings in the work area, and removal and capping of utilities lines associated with the former buildings in the work area. In general, the work area is bounded by Orion Street to the west, Wyman Park to the north, a parking lot to the east, and Avenue C/Neptune Drive to the south (Figures 2 and 3).

All work will be conducted in accordance with all pertinent NAS, state, local and federal regulations and this Work Plan. This Site 9 cleanup will be performed while providing adequate protection of underground and overhead utilities including storm drains that transect the site underground.

3.0 PROJECT SUPERVISION

Mr. Bruce Newman will serve as the project manager for this project and serve as the single point of contact for the project to communicate and interact with Navy personnel and their representatives. Mr. Michael Rose will serve as the full-time site superintendent and will be on-site during normal working hours, and be available to attend scheduled meetings as necessary. A brief overview of the qualifications of Mssrs. Newman and Rose are provided as Attachment A.

Oak anticipates attending a pre -construction meeting to be held at the NAS Brunswick prior to initiation of field activities to facilitate project execution in a manner consistent with the procedures of the base and foster appropriate communication throughout the project duration. It is anticipated that the meeting shall be one working day in length.

4.0 WORKPLAN CONTENTS

Per the project specifications, the Work Plan includes the following elements.

- Laboratory(ies) proposed to be used for waste characterization and clean fill certification, required detection limits, and the contracted turnaround time for sample analysis.
- Method to stockpile material in a manner that will prevent wind and water erosion of soil away from the work area.
- Method to document sample collection and analytical records such that analysis can be tracked back to each stockpile or container prior to disposal.
- Method to handle items not anticipated (tanks, compressed gas cylinders, asbestos materials and drums) if encountered.
- Method for erosion control from work areas, particularly protection of the adjacent water bodies during all site activities.

- Approach for handling of water encountered in the excavation.
- A detailed schedule for completion of the work described in this SOW.
- Method for spill prevention and spill response.
- Method of decontamination for vehicles and recycling, where feasible, materials exiting the site.
- Method to direct transportation activities within an acceptable timeframe, to control site working hours, to comply with security inspection requirements and to minimize disturbance to local residents.
- Site drawing(s), illustrating proposed work areas, including loading areas, decon areas, staging areas, site traffic patterns, and equipment lay down areas.
- A Site Health and Safety Plan (SHSP) that conforms to the requirements set forth by OSHA and 29 CFR1910.120 (HAZWOPER), US Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM 385-1-1), and other pertinent OSHA requirements specific to the anticipated site activities, approved by a Certified Industrial Hygienist.

In addition, information is provided on the proposed Transporters and Disposal Facilities for off-site transportation and disposal of soils and/or waste from the site. Contingencies may arise such that additional transporters and disposal facilities may be required. In these instances, Oak will provide the required information to the Navy for approval prior to using them for either transportation or disposal services.

5.0 LABORATORIES

Three laboratories are identified for performing chemical analyses of samples, as follows:

Katahdin Analytical Services
340 Country Road No. 5
P.O. Box 720, Westbrook, ME 04098
(207) 874-2400

Alpha Analytical Labs
8 Walkup Drive
Westborough, MA 01581
(508) 898-9193

ESS Laboratory
185 Frances Avenue
Cranston, RI 02910
(401) 461-4486

All three laboratories are certified by the Naval Facilities Engineering Service Center and have done work at Brunswick, NAS. The NFESC certifications for Katahdin and Alpha Analytical are provided in Attachment B. Note: ESS is currently undergoing NFESC re-certification and will only be maintained as part of the laboratory pool for this project pending a successful outcome of this re-certification.

5.1 Contracted Turnaround Time

The laboratories will be contracted to meet the project specified turnaround time of providing a hardcopy of results to the contracting officer within 5 days of sample collection. Oak anticipates using only one laboratory for the duration of the project. However, the project turnaround time of 5 days can be challenging for the types of analyses specified. Accordingly, backup laboratories will be in place should the primary laboratory anticipate and/or encounter difficulties at any point in the project in meeting project specifications.

5.2 Laboratory Detection Limits

Three types of chemical analyses will be performed for this project: (1) chemical analyses of waste piles; (2) confirmatory sampling of excavation; and (3) sampling of backfill materials. The required detection limits for each sample type are identified below.

Types of Samples	**Data Quality Objectives / Required Detection Limits**
Waste Stockpile Samples	Limits for defining characteristic hazardous wastes under RCRA Disposal facility permit limits
Confirmatory Samples	MEDEP Remedial Action Guidelines and EPA Region IX PRGs/SSLs
Backfill Samples	MEDEP Remedial Action Guidelines

The proposed method detection limits are provided in Attachment C. These tables show the detection limits that the laboratories will be contractually required to meet for this project. These detection limits meet and exceed the necessary detection limits for the regulatory requirements applicable to this project.

6.0 METHOD TO STOCKPILE WASTE

Waste will be stockpiled using practices and procedures standard to the handling and management of contaminated soils, including the following:

- An erosion control barrier will be placed around the work area, which includes the

soil stockpile area, to prevent water erosion of soils away from the project site. The erosion control barrier will be constructed using silt fencing per Maine Erosion and Sediment Control BMP (Attachment D).

- There are no drainage ditches, culverts, or other surface drainage features currently identified within the anticipated work area. Should such features be present, additional erosion control features will be placed per Maine best management practices.
- Waste stockpiles will be underlain by 10 mil poly sheeting. Further, the soil stockpiles will be covered at the end of each day with 10 mil poly sheeting, or sooner if a rain event is anticipated. Once a soil stockpile (or portion thereof) has been covered, it will remain covered until loadout and off-site disposal of the stockpile is initiated.
- Waste stockpiles will be inspected daily to ensure that the covering remains in place and is properly anchored.

Due to space limitations in the work area, waste stockpiles will be created in rows oriented north-south, parallel to Orion Street. Each row will be approximately 50 feet wide and 15 feet tall, with a cross-sectional area of approximately 525 square feet (or 58.3 square yards). Every 25 foot length of the row (8.3 yards) will delineate approximately 500 cubic yards of waste, and each section will be sampled separately so as to meet disposal facility requirements for off-site disposal. Actual field measurements will be used to delineate 500 cubic yard sections of each row. The work area has sufficient room for two or more rows of 200 feet in length; thus, each row would represent approximately 4,000 cubic yards of waste.

The procedures identified above are anticipated to prevent both wind and water erosion of the soil stockpiles. Similar procedures will be used for materials brought to the site for backfill and restoration. However, Oak anticipates that the majority of these restoration materials will be used immediately upon their delivery to the site such that there will be minimal stockpiling of them.

7.0 SAMPLE COLLECTION

The primary sampling matrix at the site will be soils. As identified in Section 5.0, these soil samples will be of the waste stockpiles, backfill, and confirmatory samples of the excavation. In addition, some water samples will be collected of decontamination fluids and water removed from the excavation. Sampling at the site will be performed in accordance with the following existing document for Site 9:

> Long-Term Monitoring Plan, Site 9 (Neptune Drive Disposal Site), Naval Air Station, Brunswick, Maine, Final, August 1999 – including Appendix A – Standard Operating Procedures for Field Sampling and Appendix B – Quality Assurance Project Plan

A summary of the types of samples being collected and the chemical analyses to be performed as well as QA/QC samples is provided in Table 1.

Table 1 – Summary of Sample Types, Chemical Analyses and QA/QC Samples

	Project Samples			
	Waste Stockpile	Backfill	Excavation Confirmatory	Containerized Fluids
Media	Soil/Solid	Soil	Soil	Water
Sample Type	Composite	Composite	Grab	Grab
Chemical Analyses (w/EPA Method Number)				
TCLP Extraction - 1311	X			
VOCs – 8260	X			
SVOCs - 8270	X			
Metals - 6010	X			
Pesticides/Herbicides - 8081	X			
PCBs - 8081	X			X
TPH DRO/GRO (Maine Methods 4.1.25 and 4.1.17)	X	X		
VOCs – 8260		X	X	X
SVOCs - 8270		X	X	X
RCRA Metals - 6010		X	X	
Priority Pollutant Metals - 6010				X
QA/QC Backup				
Level III Data Package	X	X	90%	X
Level IV Data Package			10%	
QA/QC Samples (per QAPP)				
Duplicates			10%	
Matrix Spike/Matrix Spike Duplicates			5%	
Trip Blanks			1 Per Batch	
Rinsate Blanks			1 Per Week*	

*Note: This is more frequent than QAPP.

Accurate tracking of sample collection and correlation of analytical data with soil stockpiles is critical for the execution of this project. Sample tracking and documentation will include the following:

- A systematic numbering methodology (with the prefix S9 to refer to this project) where each sample has a unique identification number (ID),
- Recording of all samples collected in the field notebook.
- Completion of a chain-of-custody for each sample set (and maintenance of sample chain-of-custody).
- Preparation of a site sketch, in the field, on the day of sample collection, annotated with sample locations and identification numbers.

Specific aspects of our sample locations as well as tracking and documentation for the different types of samples are discussed below.

7.1 Waste Stockpile Samples

Sections of the waste stockpiles will be numbered sequentially (P1 through P32). Further, upon completion of a 500 cubic yard section of stockpile, water resistant placards will be placed at two locations along the slopes of the soil pile, underneath the poly sheeting used to cover the pile. In addition, a placard with the pile ID will be staked into the ground adjacent to the soil pile, outside the poly covering. The location of the soil stockpile and associated ID will be annotated on a site sketch maintained in the field.

Per the project specification and consistent with waste disposal facility criteria, Oak will collect a minimum of one 4-point composite per 500 cubic yards of waste. In general, two of the composite locations will be along the flanks of the pile and two will be on or near the crown of the pile (Figure 4). The approximate location of each sample used to generate a composite will be recorded in the field notebook. More than one composite sample per 500 cubic yards may be needed to meet disposal facility permit requirements. Each separate composite sample from a stockpile will be created from different sample locations on and within the pile. An example of the sample ID is as follows: S9-P1-1 (site ID – pile ID – sample number). The sample ID along with the field notes, annotated site sketches and pile placards will allow for accurate tracking of sample results with individual soil piles.

7.2 Backfill Samples

Each source of backfill materials will be given a unique ID, which will be recorded in the field notebook. Backfill will be certified clean fill based on direct chemical analyses of the materials being used for backfill. Samples collected at each source of backfill materials will be numbered sequentially. If more than one type of material is sampled at a given source, then the sample ID will reflect the material sampled (e.g., S9-Source1-sand1, S9-Source1-gravel1). A description of the sample location and/or a field sketch will be recorded in the field notebook.

7.3 Confirmatory Samples

The results of the confirmatory samples will be evaluated using both the Maine Remedial Action Guidelines for soils and EPA Region IX Preliminary Remediation Goals and Soil Screening Levels (Attachment C) as general guidelines. The goal of the ash and debris removal action is to show that the overall site-wide risk to human health and the environment is reduced to acceptable levels. To achieve this, the Navy intends to collect approximately ninety-six (96), discrete, grab samples as follows:

- Collect a set of two sidewall samples for every 32 linear feet of excavation wall;
  - one sidewall sample will be collected from varying depths ranging from 0 to 6 feet,
  - the second sidewall sample will be collected two feet above the excavation bottom,

- Collect a sample along the floor of the excavation for every 1,024 square feet (or a 32 foot square grid).
- Perform a post-excavation risk assessment to confirm that remaining soils do not pose an unacceptable risk, as necessary.

Sample locations will also factor in visual observations in the field (e.g., soil coloring, presence/absence of ash, soil type, etc...). The initial confirmatory sample locations, based on the anticipated areas of excavation, are shown on Figure 4a, and represent the minimum number of samples to be collected. Additional samples may be collected based on excavation geometry, field observations, and laboratory results.

Confirmatory samples will be analyzed for the following parameters: VOCs via Method 8260, SVOCs via Method 8270, and total RCRA metals via Method 6010B. As noted previously, detection limits will be sufficiently low to determine whether soils remaining in place meet Maine DEP and EPA Region IX guidelines for cleanup. Each confirmatory sample will be a grab sample from a specific location. Additional excavation may be warranted based on initial results of confirmatory sampling. In this instance, additional confirmatory samples will be collected from newly excavated areas. The confirmatory sample results will be presented in a data package meeting EPA and Maine requirements for data validation and risk assessment, including all laboratory and field QA/QC samples.

Three types of information will be tracked for each confirmatory sample location: horizontal position, sample type (sidewall vs. bottom), and sample depth.

- To track horizontal position, a 32-foot grid will be established in the field. One axis will be parallel to Wyman Park and Avenue C and be given an alpha character, beginning with A. The second axis will be perpendicular to the first axis and be numbered, beginning with 1. The horizontal location will be then be assigned in the field based on this grid, using both an alpha and numeric character to identify a specific grid area (e.g., A5, D2). In addition, it is likely that there will be more than one sample per sample grid (at different depths). So, samples from the same sample grid will also be assigned a sequential number.
- The type of sample will be either an SW for sidewall or B for bottom sample.
- The approximate depth of the sample, in feet, will be recorded and used in the sample ID, immediately following the sample type. For example, the sample ID of S9-D2-SW4-1 will be the first sample from grid D2, from the sidewall at a depth of 4 feet.

The above information will be recorded in the field notebook, will be annotated on site sketches, and will be used throughout the sample labeling and chain-of-custody process.

8.0 UNANTICIPATED WASTE

A variety of waste materials can be encountered when excavating in a disposal area. Because the project is expected to consist primarily of the excavation of soil and/or ash,

any non-soil/ash materials will be inspected visually. Non-hazardous materials that may be encountered, including concrete, brick, wood and metal, will be segregated and disposed of separately, as necessary to accommodate the disposal facility requirements. Potentially hazardous materials include asbestos-containing materials (ACM), objects that may include liquids and gases, and unexploded ordnance. These materials are presented in the order of greater likelihood to lesser likelihood. The Site Health and Safety Plan provides procedures for addressing each of these material types. A summary of key items is presented below. In all cases, the Navy will be notified immediately of the presence of potentially hazardous materials and the procedures being used to address their presence.

8.1 ACM

The potential presence of ACM will be based on visual evidence. Mr. Rose, the on-site superintendent, has many years of experience in excavation and segregation of debris from waste areas and old landfills, including materials with ACM. Further, all on-site workers will be reminded to be alert for the possible presence of ACM materials. This will be particularly important for the portion of the project involving abandonment of utility lines since older utility materials have a greater potential for containing ACM.

Where visual inspection identifies a material considered suspect ACM, a Maine licensed asbestos inspector will be used to formally evaluate and test the material. Further handling of the materials will be based on the findings of the asbestos inspector. As required, procedures specific for the continued excavation, handling and disposal of ACM will be provided as an amendment to this Work Plan and SHSP, per Maine Chapter 425 Asbestos Management Regulations.

8.2 Liquid and Gas Containers

Excavation activities in and around any containers identified as potentially containing liquids or gases will be immediately terminated. Mr. Rose, the on-site supervisor will direct specific actions to be taken based on the following types of information:

- Condition of the container (and its likelihood of being intact)
- Presence of labels or markings
- Evidence of environmental release (including results of air monitoring instruments)
- Potential for environmental release
- For gas cylinders, the apparent condition of the valve

Following this initial assessment, the Navy will be alerted to the presence of the container(s) and the procedures for addressing removal and continued excavation.

8.3 Unexploded Ordnance

As part of the on-site health and safety briefings, the project team will be reminded of the potential for encountering unexploded ordnance (UXO) whenever working at military

installations. Mr. Rose, the on-site supervisor, has extensive experience working at military installations and a working awareness of the hazards of UXO. While the potential for encountering UXO is considered very low, the potential hazards presented by UXO are very high. Thus, any metallic objects of unrecognizeable shape will be brought to the attention of Mr. Rose, and will not be disturbed pending further on-site evaluation. As warranted, the Navy will be alerted to the potential presence of UXO, and certified EOD technicians will be used to mitigate the potential impacts of UXO on the project.

9.0 EROSION CONTROL

Erosion control for the project will be per Maine Erosion and Sediment Control BMP. Erosion controls will be used around the soil stockpiles and the work area, as described above under management of the soil stockpiles. The emplacement of the silt fencing around the work area will be the first field activity conducted at the site. The erosion controls will be periodically inspected and maintained throughout the project to ensure that stormwater is not washing soils away from the work area. In addition, existing storm drains in Wyman Park or along Avenue C (or any other nearby areas) will be protected from soil runoff by use of hay bales around the storm drain should they have the potential to be impacted by site activities.

10.0 HANDLING OF WATER IN EXCAVATION

Any water pumped from the excavation will be containerized (e.g., frac tanks). Specifically, Oak anticipates that two, 20,000 gallon frac tanks will be needed to handle the construction water. The water will be tested and disposed of in accordance with federal, state and base requirements. As noted in the workplan, EMI has been identified as an appropriately permitted transporter and disposal facility for liquid wastes. Based on the chemical quality of the water, the Navy may elect on-site treatment of the water using a combination of filters (e.g., particulate, carbon). If on-site treatment is performed, post-treatment chemical analyses of water will be performed prior to discharge. Any discharge of treated water will be coordinated with BNAS Water Resources, and treated water concentrations will meet MEDEP drinking water standards and/or other applicable standards (e.g., Maine Maximum Exposure Guidelines for discharges to the ground, and Ambient Water Quality Criteria for discharges to surface water bodies). Also, standard construction approaches will be used to minimize the quantities of water pumped from the excavation. This will include use of materials in the excavation to create temporary sumps and/or dams to control/contain excavation water and facilitate excavation activities.

11.0 DETAILED SCHEDULE

A detailed project schedule is included as Figure 5 to this Work Plan. This schedule is based on receiving an approval to mobilize to the site by October 26, 2005. Further, this schedule assumes that there will be no or minimal delays or disruption of work due to

weather conditions. Nonetheless, the schedule presents the tasks to be performed, their order, their anticipated durations, and their inter-relationships.

The project schedule will be maintained throughout the project duration. Updated project schedules will be provided as part of the regular project status reports.

12.0 SPILL PREVENTION AND RESPONSE

The SHSP includes specific procedures for addressing spills. In general, there are few liquids that will be stored on-site or that are anticipated. A fuel truck will be contracted locally for periodic fueling of on-site equipment. Oak will ensure that the fuel truck is fully equipped with spill response equipment. In addition, a spill kit will be maintained on-site consisting of a 55-gallon drum, absorbent pads, absorbent granular material and a shovel. All spills will be reported to the Navy and addressed as required by Maine DEP requirements in accordance with Maine Chapter 800 Hazardous Materials Identification. For any spill more than 2 gallons, on-site personnel will call [207] 921-3333 to notify the Fire Department who will assume on-site control of all spill containment and control measures. The Oak Team will assist as directed by the BNAS Fire Department.

13.0 DECONTAMINATION

An equipment and personnel decontamination station will be established adjacent to the work area. The decontamination pad will be located such that contaminated materials will be prevented from leaving the work zone. A drawing showing the design of the decontamination pad is provided in Figure 6. The decontamination pad will be large enough to accommodate individual pieces of equipment (e.g., excavator) while providing room to contain overspray (approximately 15 feet by 30 feet). As shown on Figure 6, the decontamination pad will contain a water tank to hold the decon water, a pressure washer/sprayer for equipment decon, a trash receptacle for waste PPE, a pump to collect decon water (as needed), and a personnel washing station. A liquid detergent (e.g., Liquinox) will be used, as needed, to ensure adequate decontamination of equipment.

Decontamination fluids and solids shall be captured daily, and stored on site then characterized and disposed of as appropriate in accordance with Base, Federal, state and local environmental regulations.

14.0 TRANSPORTATION MANAGEMENT

Transportation management will be a key element of this project because of the volume of materials to be transported off-site as well as the restoration materials required to be shipped on-site. Transportation management will include the following:

- Use of established traffic patterns,
- Scheduling,

- Prevention of dust tracking, and
- Waste documentation.

14.1 Established Traffic Patterns

Dyer's Gate off of Route 123 (Harpswell Road) will be used for access to the base. This gate will also be used for vehicles departing from the base. On-base, trucks will take the direct route from Dyer's Gate to the work area and enter the work area via Avenue C, and use the same route for departure from the site. A figure showing the anticipated traffic patterns is provided under the following Section.

14.2 Scheduling of Transportation

Transportation of soils for off-site disposal will only be scheduled once all proper documentation is available. The hours for loading and off-site transportation are limited by the operational hours of the disposal facilities, typically 7:30 AM to 4:30 PM. Accordingly, loading of trucks for off-site disposal will be conducted between 6:30 AM and 4:00 PM. The number of trucks will be established to match the loading capacity of the on-site equipment and the ability of the disposal facility to receive the waste. Four to six trucks per day are anticipated (with each truck making multiple trips throughout the day). Further, the arrival of the trucks will be staggered throughout the day to minimize on-site waiting/parking of trucks. Shipment of wastes on weekends is not anticipated.

Materials being delivered to the site will be scheduled to arrive during normal working hours (6 AM to 4 PM). The number of truck deliveries will be matched to the crew capacity for using the delivered materials. Truck deliveries may occur at the rate of two to six trucks per day during the restoration stages of the project, with each truck making multiple deliveries per day.

14.3 Prevention of Soil Tracking

Oak will ensure that there is no visible material on the sides or tires of any vehicle leaving the site, or leaving the staging area. A truck tracking pad will be placed before the exit from the work area. Oak will use mechanical means such as a pressure washer to ensure that soil is not tracked beyond designated work areas onto surrounding roadways. Note: the work area includes the area of contamination as well as the surrounding areas for staging of equipment and other related activities. Trucks are NOT anticipated to be entering into any contaminated areas, thus, any dust or soil removed from the trucks is expected to be uncontaminated.

Oak will ensure that all vehicles used for T&D are equipped with appropriate appurtenances (e.g. tarps) in acceptable working condition. All loads must be covered prior to departure. Liners will be used if vehicle beds do not properly seal when closed.

14.4 Waste Documentation

Materials being disposed of from the site will be accompanied by either a Bill of Lading or a Waste Manifest. In some instances, other forms of documentation can be used. Miscellaneous trash generated at the site by the workers will not be subject to this Material Tracking Plan.

Oak will generate waste manifest for the soils and/or debris generated from the work area. A field review will be performed of the documentation provided for transport of wastes to ensure completeness. The waste manifest will be presented to the Navy for approval and signoff. A completed, signed waste manifest will then initiate the off-site disposal process. Documentation [manifests] for hazardous waste departing the air station must be initialed by the Base coordinator, Dale Mosher, [207] 921-2702 before leaving the Base and a copy of the manifest presented to the ROICC

Oak will maintain a project log which documents the waste disposal process. The log will include information such as date, vehicle ID, type of waste, disposal facility, and a confirmation that the driver has received appropriate paperwork. Oak will ensure that each truck driver has a copy of the waste manifest. Oak will also confirm with each driver, prior to departure, the shipment destination. Oak will provide written directions to drivers, as needed.

Each day, Oak will be in communication with the vehicle drivers and the disposal facilities to verify that waste shipments have been delivered and received. The disposal facilities will provide weight slips for trucks at certified scales located at the disposal facilities. The weight slips will document the total weight of the truck including waste as well as the tare weight of the vehicle following dumping of the waste at the site. Quantities of decontamination water will be documented via flow meter to the nearest gallon.

Oak will compile all completed waste manifests, including signatures by the receiving facilities, and provide copies to the Navy within required timeframes. Oak will also maintain and provide a summary of all waste shipments. Oak will also submit Certificates of Treatment/Disposal from the final disposal facility. Certificates of Treatment/Disposal will include the number of the manifest, date when the waste was transported off-site, and a description of the waste as reported on the manifest. Certificates will be submitted within 10 days of final waste disposal. These Certificates will be received separately and prior to invoicing.

15.0 SITE DRAWINGS

Figures 2, 3, 4, 4a and 7 show the following:

- general area of the site,
- proposed work areas,
- decontamination areas,
- staging areas,
- equipment lay down areas, and
- proposed traffic patterns.

Some adjustments to these areas/items may be necessary throughout the duration of the project. As necessary (e.g., traffic patterns), Oak will coordinate with the Navy prior to implementing any changes to these areas and items.

16.0 SITE HEALTH AND SAFETY PLAN

A Site Health and Safety Plan (SHSP) is provided as a stand-alone document to ensure that work is conducted safely, in accordance with OSHA requirements at 29 CFR 1910.120. A copy of the SHSP will be kept on-site at all times during the time that work is being performed. The project team will be fully briefed on the procedures in the SHSP, and daily health and safety briefings will be held to highlight key topics and procedures. The project team is very experienced in working at sites with a SHSP and executing projects in a manner safe to on-site workers, visitors, and the surrounding community.

17.0 TRANSPORTER INFORMATION

The majority of waste generated during this project is anticipated to consist of soils and ash. Two transporters are identified for these materials: CPRC and Sam's. In addition, these transporters can handle other solid waste materials. Oak anticipates using only one transporter of soils for this project; however, two transporters are identified as a contingency to avoid and/or minimize potential project delays.

Some water may also be generated as a result of decontamination activities and construction dewatering. The transporter EMI is identified should it be necessary to transport these materials off-site for disposal.

A summary of key information is provided below. Additional information for each transporter is provided in Attachment E.

	CPRC	K-B Corp.	EMI
Type of Waste	Soils/Solid	Soils/Solid	Water/Liquids
USDOT Safety Rating	Satisfactory	Satisfactory	Satisfactory
DOT Permits	061504	0527207	315266
Overweight Permits	As Needed	As Needed	None

18.0 DISPOSAL FACILITY INFORMATION

As noted previously, the majority of waste to be generated by this project is expected to consist of soils and ash. The CPRC disposal facility is a soil recycling facility permitted for the disposal of petroleum contaminated soils and ash. The type of wastes at Site 9 are compatible with CPRC's permit and operating requirements, and the analytical data available from previous investigations indicates that the soils meet CPRC's facility acceptance criteria. The results of the soil pile analytical characterization will be used to determine whether specific soil piles also meet CPRC's acceptance criteria.

Two additional facilities are identified for the disposal of soils, they include the Town of Brunswick solid waste landfill and the Pine Tree solid waste landfill. Each of these facilities are able to accept non-hazardous, contaminated soils. In addition, they are able to accept any solid waste that is encountered and segregated during the soil excavation process.

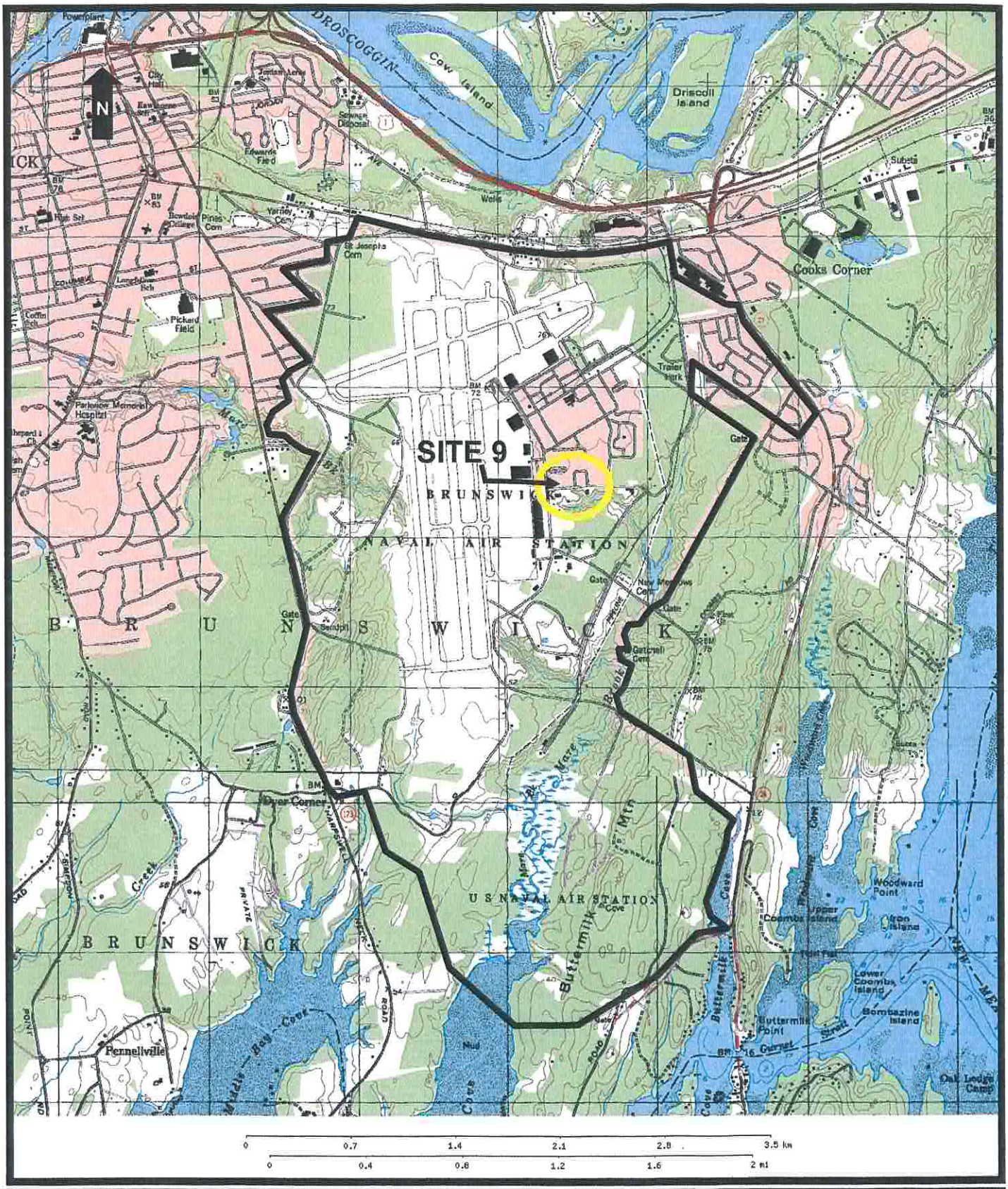
Once each soil stockpile is chemically characterized, appropriate waste disposal documentation will be prepared and presented to the Navy. The specific disposal facility for each pile will be identified on the waste disposal documentation; and Oak will ensure that the analytical data for the soils meet the disposal facility's acceptance criteria and permit conditions.

Water wastes may also be generated. EMI operates a treatment facility for contaminated water and liquid wastes, both hazardous and non-hazardous. The EMI treatment facility is identified as appropriate for receiving contaminated water and liquid wastes requiring off-site disposal.

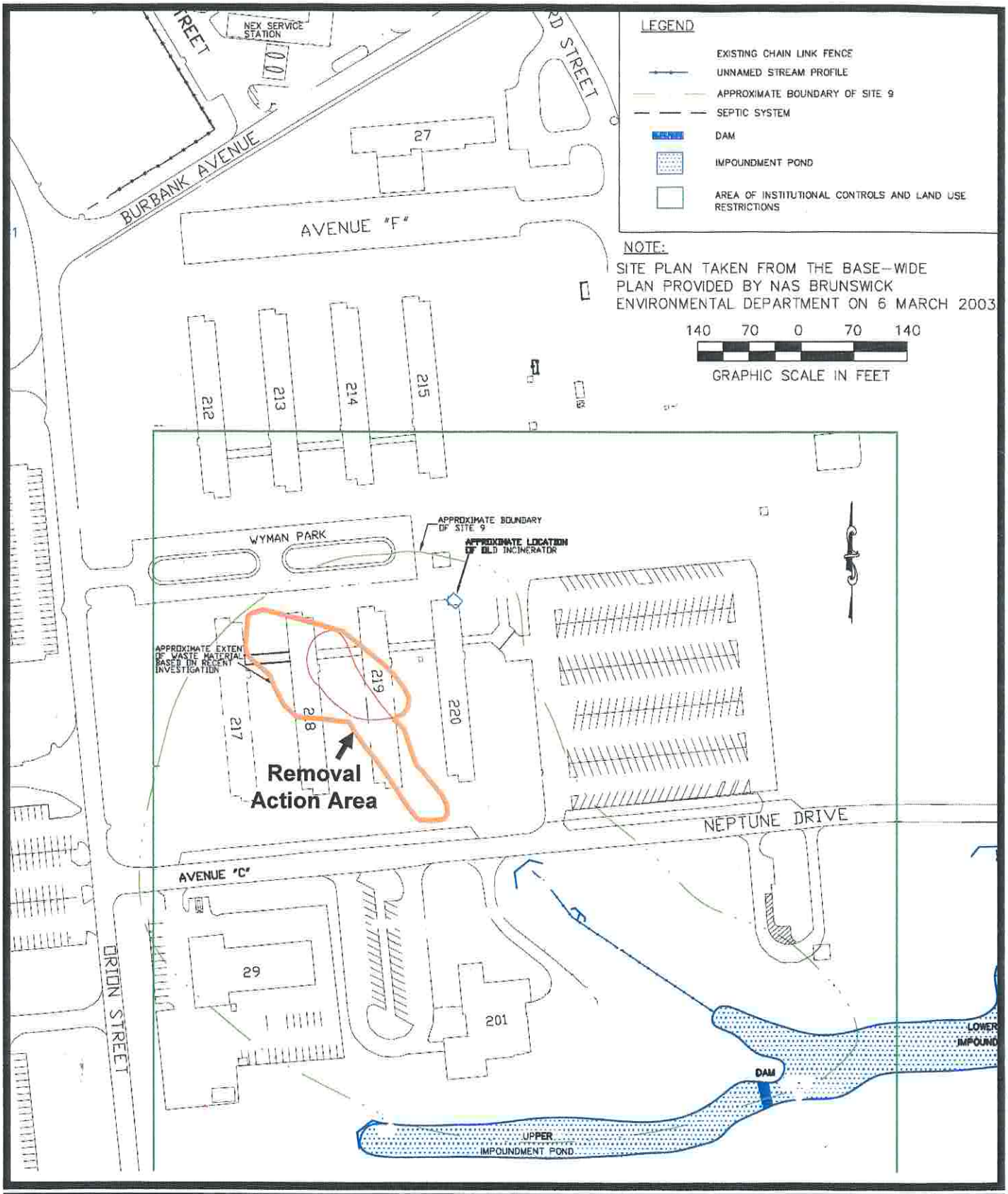
A summary of key information for these disposal facilities is presented below. More detailed information is provided in Appendix F.

	Facilities			
	CPRC	Brunswick Lf.	Pine Tree Lf.	EMI
Type of Waste	Soil and ash	Soil/solid waste	ACM/soil/solid waste	Water/liquids
Type of Facility	Recycling	Landfill	Landfill	TSDF*
Location	2 Gibson Road Scarborough, ME	Graham Road Brunswick, ME	358 Emerson Mill Road Hampden, ME	106 Maine Street South Portland, ME
EPA ID #/ Permit #	S-021243-WK-A-N	S-008458-WC-F-N	49-1987-19280	MED 019051069
Facility POC	Reggie Saunders (207) 883-3325	Craig Worth (207) 725-6654	Martin Drew (207) 862-4200	Dave Grant (207) 799-7377
Hours	6:30 to 4:30	8:00 to 4:00	6:00 to 7:30	24 hours per day
Regulatory POC	Randy McMullan MEDEP	None Specified	Cyndi Darling (207) 941-4570	Lee Ann DelMonte (800) 966-1102
Date of Last Inspection	January 2005	March 2005	November 2004	August 2004
List of NOVs	See Attachment F			
Environmental Permits	See Attachment F			
Weight Scale Certificate	See Attachment F			None
Analytical Requirements	See Attachment F			

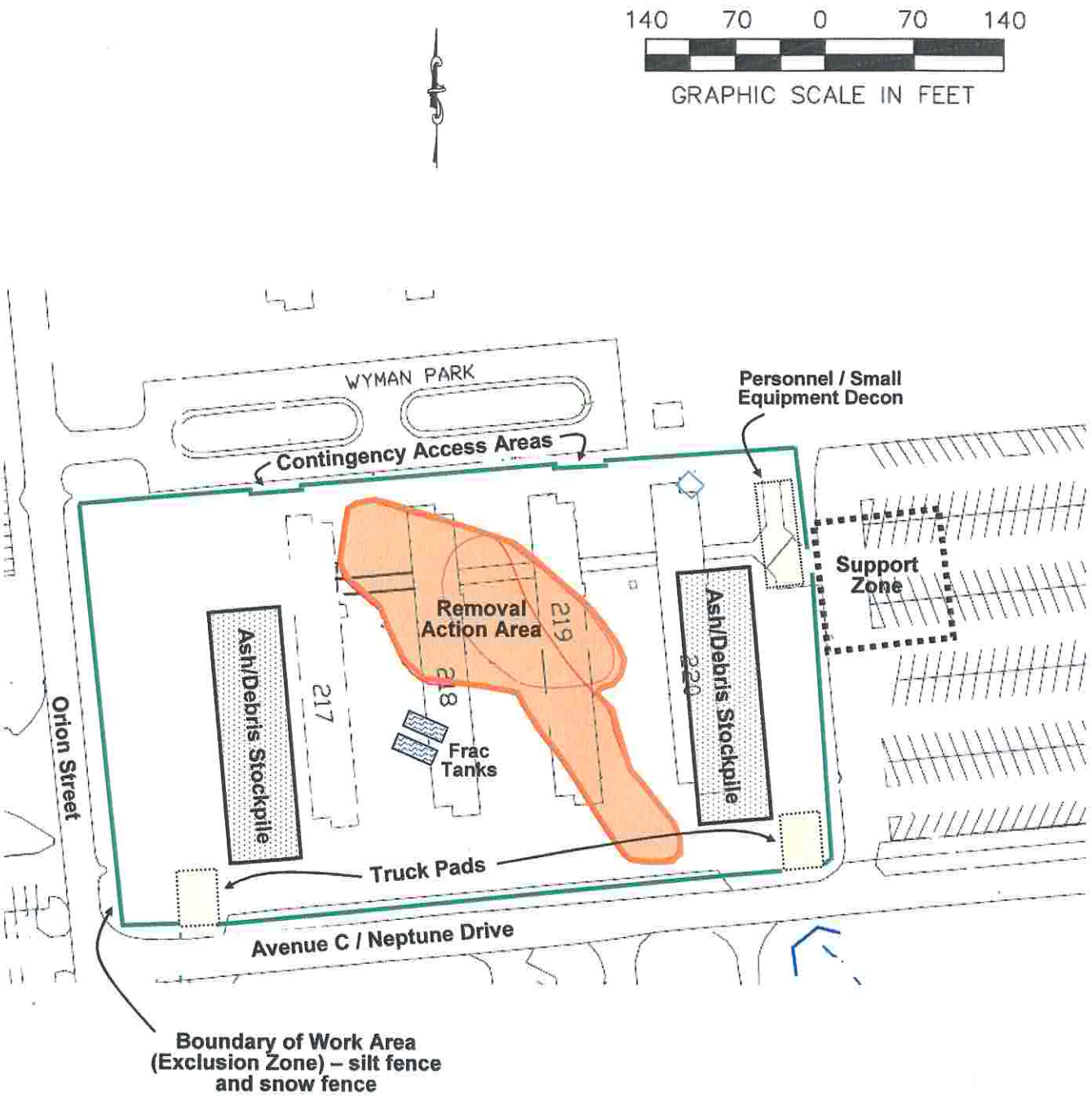
* Treatment Storage Disposal Facility under RCRA Subpart C



NAVAL AIR STATION BRUNSWICK, MAINE	**Figure 1: SITE 9 LOCATION MAP**		
	Source: USGS	LOCUS.ppt	October 2005



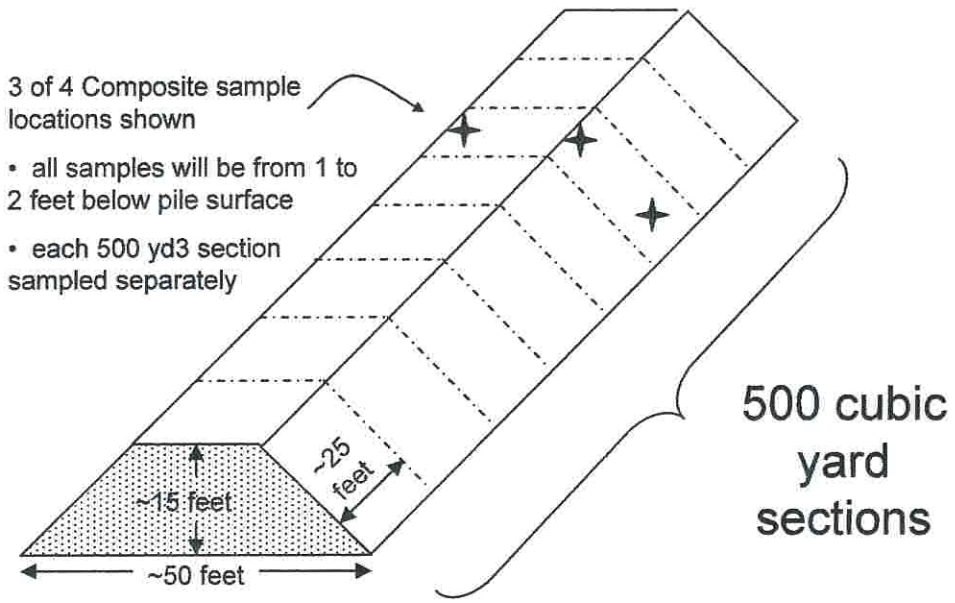
NAVAL AIR STATION BRUNSWICK, MAINE	**Figure 2: Site 9 Vicinity**		
	Source: USGS	LOCUS.ppt	July 2005

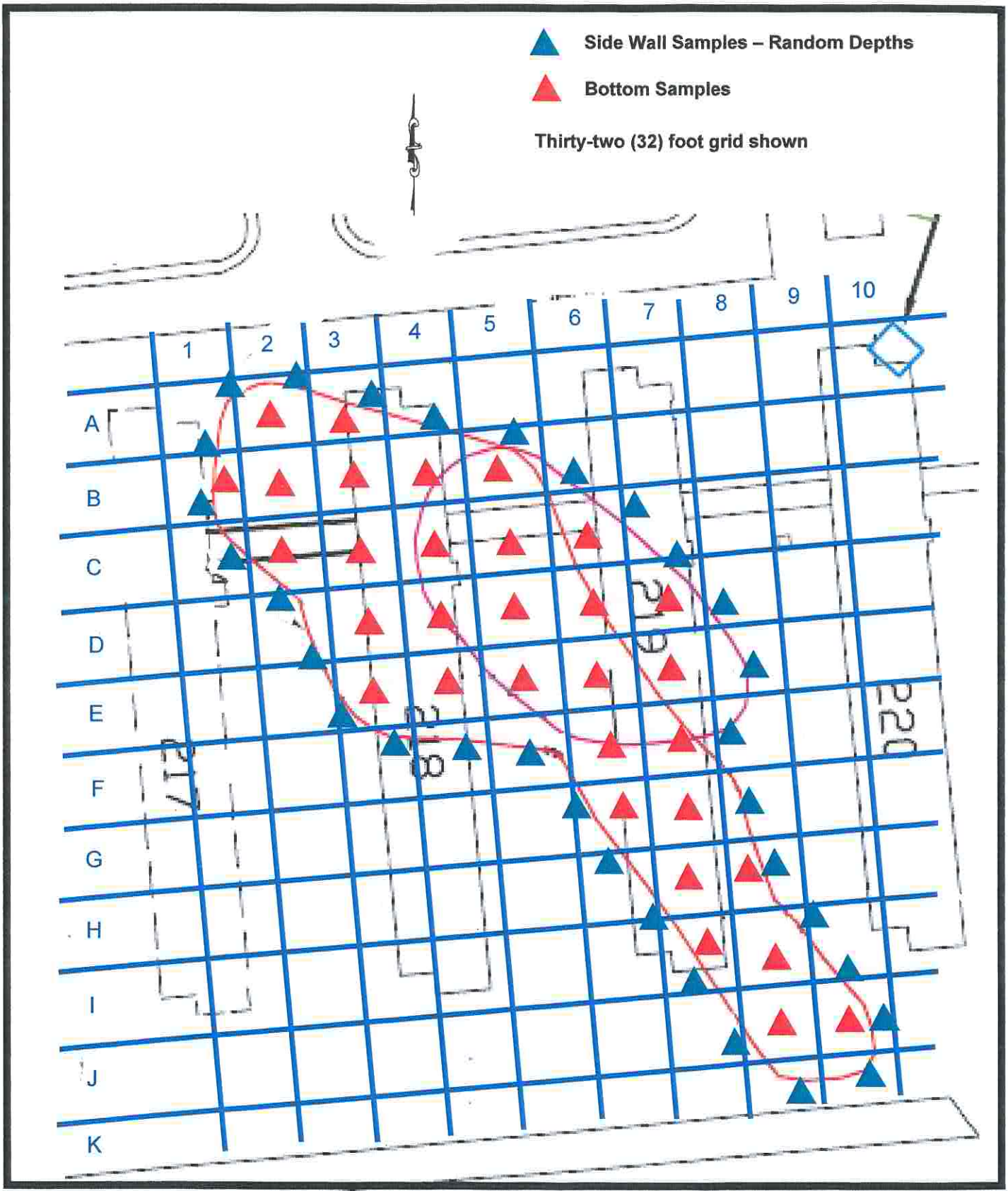


Note: Support Zone will be located in area of parking lot designated by BNAS for electrical hookup.

NAVAL AIR STATION BRUNSWICK, MAINE	PROJECT DESCRIPTION
	Figure 3: Removal Action Work Area
	Source: USGS

Figure 4 – Schematic Illustration of Waste Stockpile

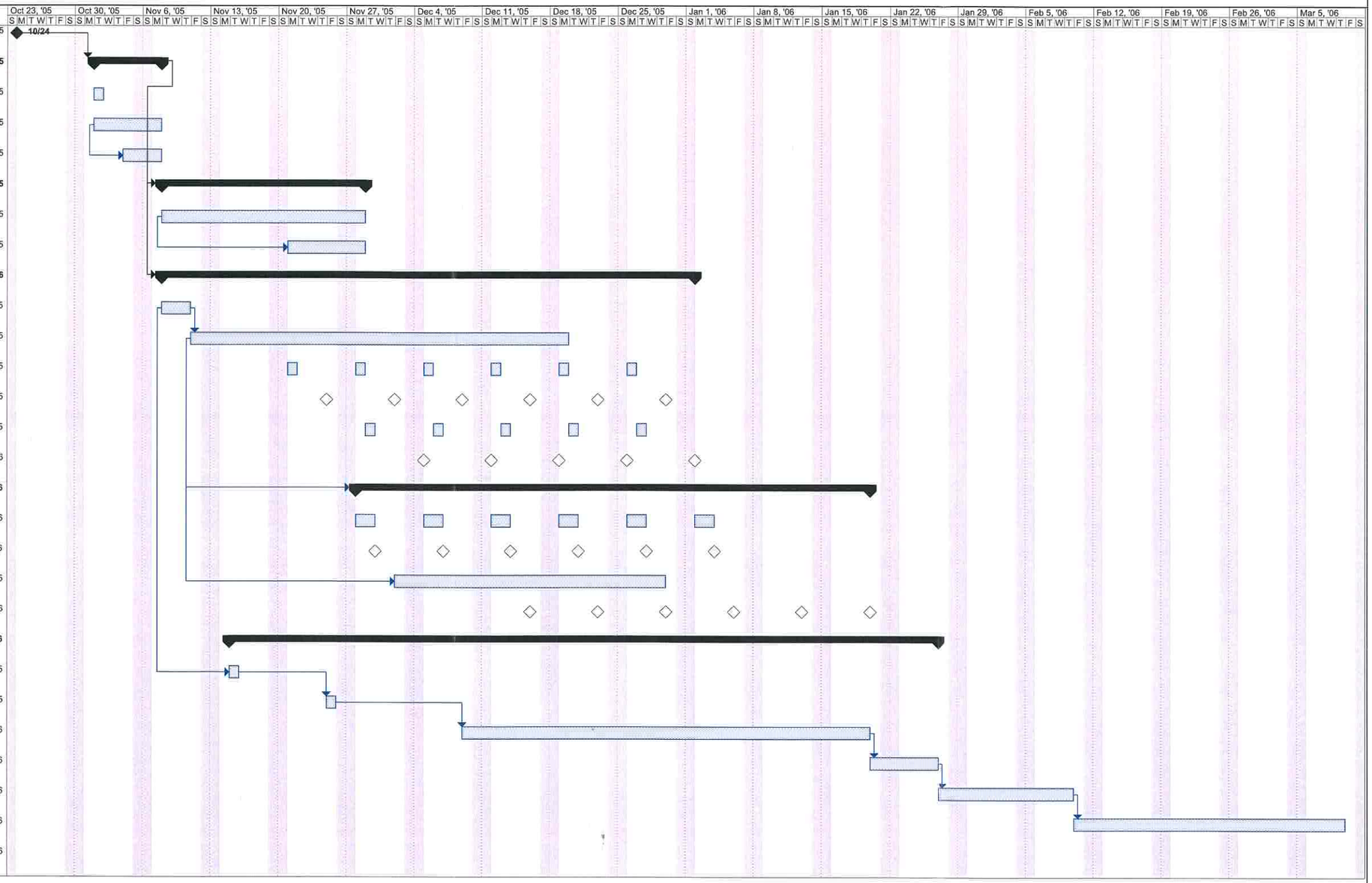




NAVAL AIR STATION BRUNSWICK, MAINE	PROJECT DESCRIPTION
	Figure 4a: Confirmatory Sampling Overview
	Source: USGS

Figure 5 - Anticipated Project Schedule - Site 9 Ash Landfill/Dump Removal Action

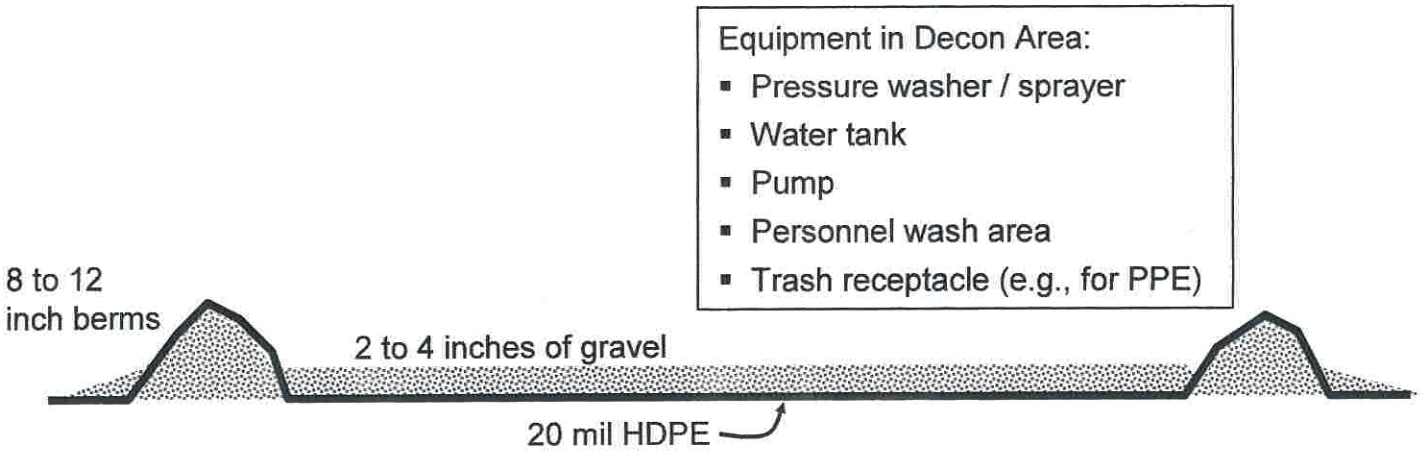
ID	Task Name	Duration	Start	Finish
1	**Authorization to Mobilize**	0 days	Mon 10/24/05	Mon 10/24/05
2	**Mobilization**	**5 days**	**Tue 11/1/05**	**Mon 11/7/05**
3	Utility Clearance	1 day	Tue 11/1/05	Tue 11/1/05
4	Mobilize Equipment	5 days	Tue 11/1/05	Mon 11/7/05
5	Install Erosion Controls	2 days	Fri 11/4/05	Mon 11/7/05
6	**Demolition Activities**	**15 days**	**Tue 11/8/05**	**Mon 11/28/05**
7	Remove Slabs/Foundations	15 days	Tue 11/8/05	Mon 11/28/05
8	Remove and Cap Utilities	6 days	Mon 11/21/05	Mon 11/28/05
9	**Soil/Ash Excavation**	**39 days**	**Tue 11/8/05**	**Mon 1/2/06**
10	Strip and Stockpile Topsoil	3 days	Tue 11/8/05	Thu 11/10/05
11	Excavate Soils/Ash	27 days	Fri 11/11/05	Mon 12/19/05
12	Sample Soil Piles	26 days	Mon 11/21/05	Mon 12/26/05
19	Submit Pile Results	25 days	Fri 11/25/05	Fri 12/30/05
26	Confirmatory Sampling	21 days	Tue 11/29/05	Tue 12/27/05
32	Submit Confirmatory Data	20 days	Mon 12/5/05	Mon 1/2/06
38	**Off-Site Disposal of Soils**	**39 days**	**Mon 11/28/05**	**Fri 1/20/06**
39	Prepare/Submit Waste Manifests	27 days	Mon 11/28/05	Tue 1/3/06
46	Receive Signed Manifests	25 days	Wed 11/30/05	Wed 1/4/06
53	Load/Transport Soils	20 days	Fri 12/2/05	Thu 12/29/05
54	Submit Disposal Certification	25 days	Fri 12/16/05	Fri 1/20/06
61	**Excavation Backfill**	**53 days**	**Tue 11/15/05**	**Thu 1/26/06**
62	Sample Backfill	1 day	Tue 11/15/05	Tue 11/15/05
63	Submit Backfill Lab Data	1 day	Fri 11/25/05	Fri 11/25/05
64	Place and Compact Backfill	30 days	Fri 12/9/05	Thu 1/19/06
65	Initial Restoration	5 days	Fri 1/20/06	Thu 1/26/06
66	**Demobilization**	10 days	Fri 1/27/06	Thu 2/9/06
67	**Prepare/Submit Final Documentation**	20 days	Fri 2/10/06	Thu 3/9/06
68	**Final Restoration (not shown)**	5 days	Mon 4/24/06	Fri 4/28/06

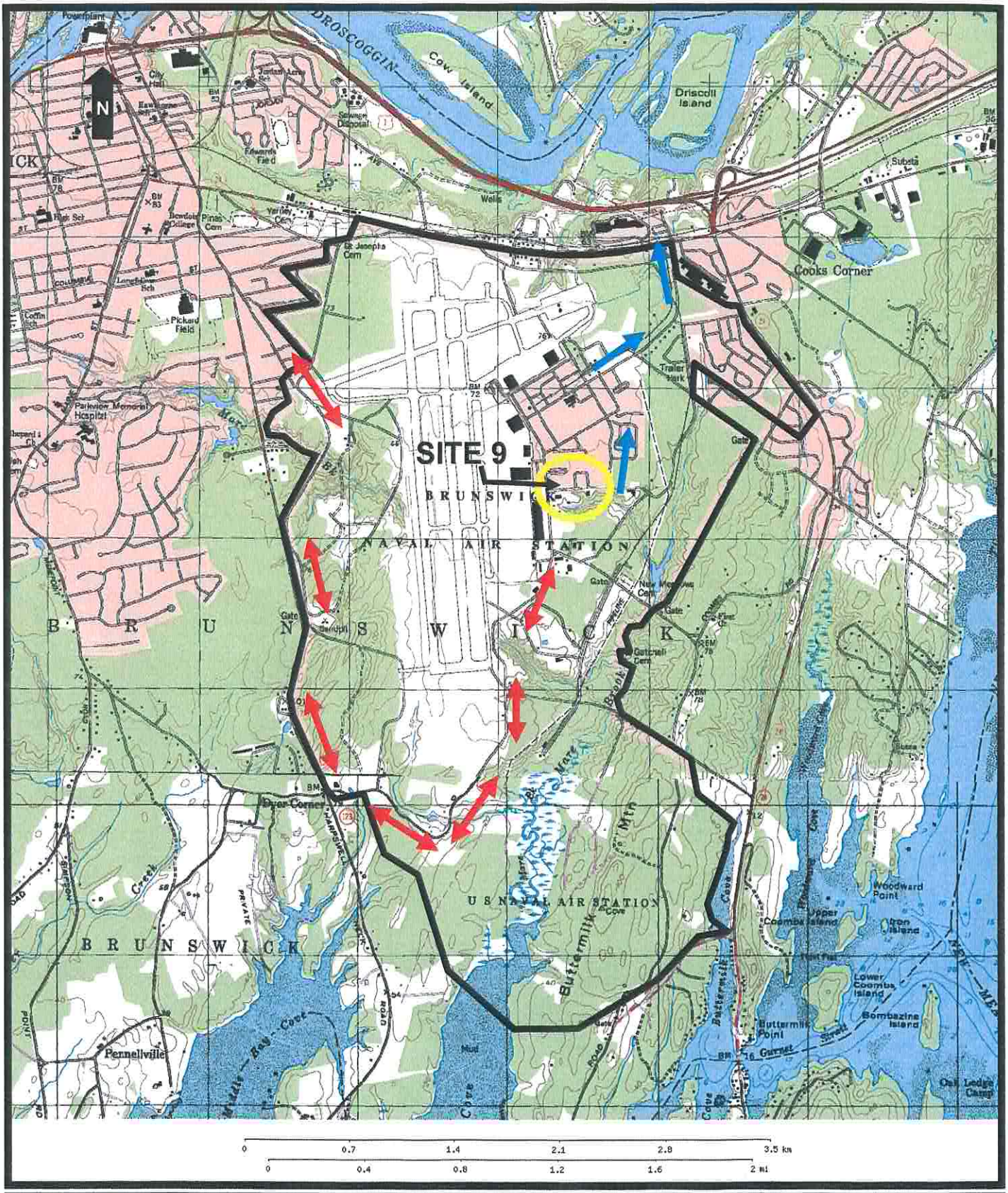


Project: schedule r2.mpp
Date: Tue 10/18/05

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Figure 6 – Schematic Cross-Section of Decontamination Pad





NAVAL AIR STATION
BRUNSWICK, MAINE

Figure 7: Truck Traffic Patterns

Source: USGS

Bruce Newman
Program Manager
OAK Environmental Consultants, Inc.

EDUCATION: Florida State University, M.S. Marine and Environmental Sciences
West Chester State University, B.S. Comprehensive Science and Education

SPECIAL QUALIFICATIONS:

Mr. Newman has been successfully performing as Program Manager on other contracts including the EFANE SBEMAC, EBS and Multi-trade Construction Services contracts. Mr. Newman acts as single point of contact on these contracts for the Navy and ensures that the full resources of OAK and our teaming partners are immediately available for timely task execution.

Mr. Newman has gained extensive experience in the management of complex multi-million dollar construction projects for military clients through his work on our US Army Corp of Engineer Task Order Construction Contracts (TOC for USACE NY and USACE Baltimore, and numerous multi-trade construction contracts. As these contracts are all being performed within the EFANE footprint Mr. Newman has also gained invaluable experience and familiarity with all applicable building codes, regulations, climactic, labor and economic conditions which could have significant affect on task execution.

Mr. Newman routinely interacts with the senior corporate management of our Teaming Partners and subcontractors and our own forces; acting as nexus for effective communications between them our Clients to ensure effective application of team resources.

Mr. Newman provides overall, corporate-level direction for implementation of project management plans, policies, procedures and performance standards. He is vested with overall corporate authority for project execution within the guidelines of the Contract Documents, and is also the corporate liaison to which any stakeholder may turn for coordination and resolution of project issues.

Mr. Newman assures that Project Managers secure an appropriate number of bids for each task order; provide cost realism, lowest risk and best value analyses, assures compliance with FAR requirements as well as site issues such as Project CQC and HASP. Mr. Newman is responsible for managing and overseeing multiple, simultaneous projects. As the Program Manager, Mr. Newman has the authority to make decisions and recommendations on contractual and technical matters on a contract, project or task order, and is responsible for careful observance of corporate policies and objectives. Specific activities include; staffing of onsite personnel, contract administration, liaison with Client, job-site safety and quality control programs, project profit and loss, scheduling, administrative and technical support.

Mr. Newman oversees OAK's financial personnel to insure all bonds and insurances are in place. Working with the PQCM and SHM, he ensures that all subcontractors are in compliance with the task Statement of Work; compliance with Contractor Quality Control and Safety and Health issues; and that Base security and other procedures are properly followed.

As the project liaison between the ROICC office and OAK's forces and sub-contractors Mr. Newman keeps projects running smoothly and has demonstrated a consistent track record for bringing in task orders on time and within budget. Mr. Newman has also designed and implemented a number of operations and management programs for various public and private clients throughout the country.

His additional expertise in the environmental field allows OAK to help clients avoid the pitfalls of unforeseen environmental hazards.

EXPERIENCE:

Mr. Newman has over 24 years experience in all aspects of construction management including Site Characterization, Site Preparation and Specialty Construction. During his tenure in the industry, Mr. Newman has acquired varied experience in the construction field including CEO, Program Manager, QA/QC manager, Project Manager, Project Engineer, Estimator and Controller. Mr. Newman has been involved in the administrative oversight of multitudes of projects including educational, commercial, institutional and medical ranging in size from $50,000 to over $3,500,000.

Mr. Newman's prior assignments as Program Manager on TOC and TOC-like contracts have given him essential experience in resource allocation and balancing, managing of Team Partners and Subcontractors and managing multiple concurrent delivery orders of varying complexity over a large geographical area.

Mr. Newman's years of field experience in Program Management, of various construction and demolition projects, has proved invaluable in the development of project design, cost estimating and reporting to OAK'S clients. Mr. Newman has completed the US Army Corps of Engineers Quality Control for Contractors Course and is an integral part of OAK's QA/QC success.

As Program Manager Mr. Newman's duties include oversight of all aspects of the projects that OAK and our subcontractors are performing. Mr. Newman acts as the single point contact between OAK'S Project Managers, Team Members, Subcontractors and Clients allowing our Clients to access and deploy a wealth of assets with little effort.

Mr. Newman acts as Program Manager for ongoing Construction/Demolition Contracts including:

USACE NY Dist. TOC Contract, Ft. Monmouth, NJ	$10M
USACE Balto. Dist, TOC Contract, Tobyhanna, PA	$3.7M

U.S. Navy, 8a Sole-Source Contract, Newport RI	$2.5M
U.S. Navy, EMACC Contract, Northeastern U.S	$1.7M
NJIT, Campus-wide TOC Newark, NJ	$1.2M
U.S. Navy, Multi-trade Contract, Newport, RI	$0.5M
U.S. Army, Multi-trade Contract, Natick MA	$0.5M

LICENSES/CERTIFICATES:

USACE QC Management for Contractors Course, 2002
Mold Investigation & Remediation Training, 2002
NJ/PA State Lead Inspector/Risk Assessor Certification
NJ/PA State Lead-based Paint Supervisor Certification
Lead Inspector/Risk Assessor Certification (License No. 001556)
New Jersey, Delaware and Maryland Building Inspector
Philadelphia Air Management Services Asbestos Project Inspector/Asbestos Investigator
AHERA Asbestos Building Inspector
OSHA 40 hour HAZWOPER Certification

U.S. Lead Training Institute

509 Route 168, Turnersville, New Jersey 08012 (856) 401-0300

This is to certify that

Bruce Newman

has successfully completed the course entitled

HAZARDOUS WASTE OPERATIONS WORKER
OSHA 29 CFR 1910.120
40-hour Course

May 5-9, 2003

Bruce P. Newman
Director of Environmental Services

Expiration Date: 05/09/04
SS# 199-48-8417
Certificate #HW065

Michael F. Rose
Site Superintendent
Professional Qualifications

Mr. Rose oversees the field construction components of all RC&D projects. As an engineer, he has extensive real-world experience in overseeing and implementing large-scale construction projects and environmental remediation projects.

Overview of Qualifications

- Eight (8) years direct on-scene experience in hazardous waste site cleanup and waste disposal activities and over seven (7) years of supervisory experience in environmental remediation.
- Over ten (10) years of response manager/site superintendent experience. He is an approved Emergency Response Manager in EPA Regions I, II, and III. He has seven (7) years of experience in EPA Region I.
- Directs chemical and hazardous substance site cleanup and disposal activities, heavy equipment operation, and field construction on emergency activities. Experience coordinating hazardous waste transportation and disposal and enforces QA/QC, DOT, and RCRA/CERCLA requirements.
- Experience preparing written reports including site-specific work plans, daily work reports, and site progress reports.
- Procures, directs, and manages up to 40 on-scene multi-disciplinary personnel/subcontractors.
- Prepares all required financial documentation and cost tracking reports.

EDUCATION B.S., Marine Engineering, Massachusetts Maritime Academy, 1990

SPECIALIZED TRAINING

8-Hour Supervisory Training, 1995 & 2005

OSHA (29 CFR 1910.120) 40-Hour Safety Training, 1995

Licensed Construction Supervisor: Massachusetts

U.S. Coast Guard Second Assistant Engineer License: Unlimited Steam and Diesel

ON-SITE EXPERIENCE

Mr. Rose has extensive experience in the construction field as it relates to environmental remediation, contaminated material excavation, and emergency response projects. He has performed facility decontamination and demolition projects, drum removal projects, soil excavation projects, and underground and aboveground storage tank removal projects.

Mr. Rose directs chemical and hazardous substance site cleanup and disposal activities, heavy equipment operation, and field construction on emergency and planned remedial activities. He prepares and ensures adherence to all plans including work plans, spill prevention plans, and health and safety plans. Mr. Rose enforces all OSHA regulations; coordinates hazardous waste transportation and disposal; acts as the Site Safety Officer as required; and enforces QA/QC, DOT, and RCRA/CERCLA requirements.

General Construction Superintendent, Devens Landfill Remediation Project, USACE-NARAC.

- Supervise the excavating of 375,000 cy of demolition debris
- Supervise the installation of 1,200 lf. of force main and pump station.
- Oversee the Construction of an 8-acre lined-landfill to hold the construction debris.
- Provide Technical Input for dewatering, sheeting and excavating of debris underground water.
- Oversee and design dewatering construction operations.
- Oversee operation and debris placement 8-acre on-site landfill.

Construction Superintendent, Nyanza Superfund Remediation Project, Ashland, MA.

- Supervise the excavating mercury-contaminated sediments
- Supervise the installation of 1,800 linear feet of water main and services

- Coordinate Construction activities between project and subcontractors.
- Provide Technical Input for dewatering and excavating contaminated sediments.
- Walk Down heavy civil work to Verify Design Conformance
- Oversee construction of opening of 3 acre portion of a 14 acre on-site landfill and removing of 19,000 cubic yards of clean fill.

Related Positions:

Operations Engineer-Mechanical/Civil Systems, Massachusetts Turnpike Authority (MTA) Central Artery Project, Boston, MA.

- Review Project Design Specifications for all of the pump stations constructed for the Central Artery Project
- Review and Approve Contractor Submittals
- Coordinate Construction activities between project, construction, Contractor, and Outside Agency personnel
- Review and Approve Contractor As-Built Drawing Submittals
- Provide Technical Input to Owner's for interface of mechanical, electrical, and civil systems
- Walk Down Systems to Verify Design Conformance
- Oversee construction of pump stations from start to finish
- Develop System Maintenance and Test requirements for turnover requirements and Oversee Turnover Process
- Provide Input to the Construction Cost Analysis/Savings Program

Lead Maintenance Engineer – Mechanical Systems, Parsons Brinckerhoff (PB), Central Artery Project, Boston, MA.

- Develop Preventive Maintenance, Corrective Maintenance, and Energy
- Control Procedures (Lockout/Tagout)
- Implementation of Maintenance Management Integrated
- Computer System (MMIS)
- Review Project Design Specifications
- Review and Approve Contractor Maintenance Submittals
- Review and Approve Contractor As-Built Drawing Submittals
- Provide Technical Input to Owner's Maintenance Department
- Walk Down Systems to Verify Design Conformance
- Review and Approve Contractor Training Submittals
- Coordinate and Conduct Training

Owner, Operating Manager, Tri-Star Construction Company, Taunton, MA.

- Responsible for managing several construction contracts simultaneously
- Estimate contract costs and develop bids
- Negotiate contracts with owners/primary contractors
- Manage contract financing
- Schedule all contract activities
- Responsible for project staffing
- Manage and supervise project personnel including Engineers,
- Superintendents, Union Trades

Second Assistant Engineer, Maintenance/Mechanical Systems, Interlake Steamship Company, Cleveland, OH.

- Manage daily operations of a high pressure steam plant
- Supervise Operations and Maintenance Engineers
- Responsible for preventive and corrective maintenance - systems include marine boilers, boiler/burner controls, turbos, HP turbines, diesel/turbine generators, and miscellaneous support systems
- Maintain and operate various propulsion and power plants
- Schedule and supervise the overhaul and retrofit of the various systems
- Responsible for inventory control for all systems/equipment
- Accountable for refueling, fuel testing, and fuel/lube oil disposal

Chief Engineer (suction hopper dredge unlimited horsepower), Price Brothers, Toledo, OH.

- Responsible as master of hopper dredging projects
- Responsible for ship's business, deck gear operation and maintenance and miscellaneous support systems
- Maintain and operate dredge gear & dredge pump operation
- Schedule and supervise the overhaul and retrofit hydraulic, electrical and dredging systems
- Responsible for inventory control for all systems/equipment

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

86 Cummings Park, Woburn, MA 01801
(781)935-7370

IEE IEE

This is to certify that

Michael F Rose Jr

has attended the 40-hour course

Hazardous Waste Operations

pursuant to OSHA 29 CFR Part 1910.120(e)(3)I

ENTERED

April 10-14, 2000
Course Dates

April 14, 2000
Examination Date

April 14, 2001
Expiration Date

00245918020805
Certificate Number

President/Director of Training

Association of
Bay Area Governments

ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Michael Rose

has successfully completed the course titled

OSHA 8-hr Training for Supervisors

Satisfies 29 CFR 1910.120(e)(4)

on

June 20, 2005

and has earned

IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No. 43867
(verify at www.hazmatschool.com)

Terry Bursztynsky, Training Director
Sharon McCreadie, Training Coordinator
www.abag.ca.gov; (510) 464-7964

Paul W. Gantt, REA
Safety Compliance Management, Inc.

Association of
Bay Area Governments

ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Michael Rose

has successfully completed the course titled

OSHA 8-hr Annual HAZWOPER Refresher

Satisfies 29 CFR 1910.120(e)(8)

on

October 12, 2004

and has earned

IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No. 39611
(verify at www.hazmatschool.com)

Terry Bursztynsky, Training Director
Sharon McCreadie, Training Coordinator
www.abag.ca.gov; (510) 464-7964

Paul W. Gantt, REA
Safety Compliance Management, Inc.

DEPARTMENT OF THE NAVY

NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23RD AVE
PORT HUENEME CA 93043-4370

IN REPLY REFER TO:

NFESC 413
January 19, 2005

Ms. Leslie Diamond
Quality Assurance Officer
Katahdin Analytical Services
340 Country Road No. 5
Westbrook, ME 04098

Dear Ms. Diamond,

This correspondence addresses the status of Katahdin Analytical Services of Westbrook, Maine in the Navy Installation Restoration (IR) Quality Assurance (QA) Program as administered by the Naval Facilities Engineering Service Center (NFESC).

Your laboratory is accepted to perform sample analysis for the methods listed in Table 1. The period of acceptance expires July 30, 2006. This acceptance does not guarantee the delivery of any analytical samples. Acceptance is facility specific and can not be transferred to an affiliated or subcontract laboratory.

The Navy's assessment included a review of the laboratory's QA manual, selected standard operating procedures (SOPs) and SOP master list, list of major analytical instrumentation, performance test (PT) results and onsite assessment documentation[1].

The Navy reserves the right to conduct additional laboratory assessments or to suspend or revoke acceptance status for any or all of the listed parameters if deemed necessary.

Table 1

METHOD	PARAMETER	MATRIX
300 Series/9056	Anions: Bromide, Chloride, Fluoride, Nitrate, Nitrite, Orthophosphate, Phosphorus, Sulfate, Sulfide, Sulfite	Water/Solid
8260B	Volatile Organic Compounds	Water/Solid
8270C	Semivolatile Organic Compounds	Water/Solid
8011	Volatile Organics	Water/Solid
8021B	Volatile Organic Compounds	Water/Solid

[1] The State of Florida conducted the onsite on July 28-30 2004 to assess laboratory conformance with National Environmental Laboratory Accreditation Conference (NELAC) requirements.

8081A	Organochlorine Pesticides	Water/Solid
8082	Polychlorinated Biphenyls (PCBs)	Water/Solid
6010B/6020/7000A	TAL Metals: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc	Water/Solid
6020	TAL Metals: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc	Water/Solid
7196	Chromium VI	Water/Solid
1664	Total Petroleum Hydrocarbons (TPH)	Water/Solid
8015M	Total Petroleum Hydrocarbons – Gasoline Range Organics (GRO) Diesel Range Organics (DRO)	Water/Solid
9012	Cyanide	Water/Solid

Acceptance for use for parameters not identified on the table will be determined by Navy project personnel.

The laboratory should notify NFESC if there are parameters not presented on Table 1 that the laboratory expects to run on a routine basis in support of Navy installation restoration projects. In these circumstances the laboratory's capability to run the tests will be reviewed and the table will be modified accordingly.

Questions concerning the information provided should be directed to the NFESC IR QA Program coordinator, Ms. Patricia Moreno at (805) 982-1659, or via email at pati.moreno@navy.mil.

Sincerely,

for Robert J. Kratzke
Supervisor, Consultation/Information
Management Branch

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING SERVICE CENTER
1100 23RD AVE
PORT HUENEME CA 93043-4370

IN REPLY REFER TO:

NFESC 413
May 5, 2005

Ms. Ellen Collins
Quality Assurance Officer
Alpha Analytical Labs
8 Walkup Drive
Westboro, MA 01581

Dear Ms. Collins,

This correspondence addresses the status of Alpha Analytical Labs Westboro, Massachusetts in the Navy Installation Restoration (IR) Quality Assurance (QA) Program as administered by the Naval Facilities Engineering Service Center (NFESC).

Your laboratory is accepted to perform sample analysis for the methods listed in Table 1. The period of acceptance expires July 30, 2005. This acceptance does not guarantee the delivery of any analytical samples. Acceptance is facility specific and can not be transferred to an affiliated or subcontract laboratory.

Acceptance is based on a review of laboratory supplied documentation, including that associated with the latest assessment executed by the State of New York, for the National Environmental Laboratory Accreditation Program (NELAP). The NELAP assessment included an onsite inspection performed on January 7-9, 2003. The Navy's assessment included a review of the laboratory's QA manual, selected standard operating procedures (SOPs) and SOP master list, list of major analytical instrumentation, performance test (PT) results, and NELAP(NY)/U.S. Army Corps of Engineers onsite audit documentation.

The Navy reserves the right to conduct additional laboratory assessments or to suspend or revoke acceptance status for any or all of the listed parameters if deemed necessary.

Table 1

Method	Parameter	Matrix
9010B/9012A	Cyanide	Water
9013/9012A	Cyanide	Solid
8081A	Organochlorine Pesticides	Water/ Solid
8082	Polychlorinated Biphenyls	Water/ Solid
8270C	Semivolatile Organics	Water/Solid

NFESC 413
May 5, 2005

6010B/7000A	TAL Metals: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc	Water/ Solid
8015B Modified	TPH-DRO/GRO	Water/Solid
8260B	Volatile Organics	Water/Solid

Acceptance for use for parameters not identified on the table will be determined by Navy project personnel.

The laboratory should notify NFESC if there are parameters not presented on Table 1 that the laboratory expects to run on a routine basis in support of Navy installation restoration projects. In these circumstances the laboratory's capability to run the tests will be reviewed and the table will be modified accordingly.

Questions concerning the information provided should be directed to the NFESC IR QA Program coordinator, Ms. Patricia Moreno at (805) 982-1659, or via email at morenop@nfesc.navy.mil.

Sincerely,

Robert J. Kratzke
Supervisor, Consultation/Information
Management Branch

Table C-1: Detection Limits for Water/Aqueous Samples

(representative lists based on Target Compound List for organics)

Target List	Aqueous Accuracy % Recovery	Aqueous Precision RPD (1)	Water PQLs (ppb)	Water MDLs (ppb)	Maine MEGs ppb	EPA MCL ppb	AWQC ug/L
Volatile Organic Compounds - EPA Method 8260B							
Chloromethane	35-145	0-20 (nominal)	2	0.30	3	5	N/A
Bromomethane	57-139	0-20 (nominal)	2	0.58	10	N/A	N/A
Vinyl Chloride	48-132	0-20 (nominal)	2	0.30	0.2	2	N/A
Chloroethane	48-132	0-20 (nominal)	2	0.34	N/A	N/A	N/A
Acetone	65-156	0-20 (nominal)	5	1.98	700	N/A	N/A
Acrolein	62-117	0-20 (nominal)	10	1.28	N/A	N/A	N/A
1,1-Dichloroethene	88-123	0-20 (nominal)	1	0.36	0.6	7	N/A
Methyl tert-butyl ether	68-127	0-20 (nominal)	2	0.77	35	35	N/A
1,2-Dichloroethene (trans)	83-121	0-20 (nominal)	1	0.29	140	100	N/A
1,1-Dichloroethane	80-118	0-20 (nominal)	1	0.40	70	N/A	N/A
1,2-Dichloroethene (cis)	85-113	0-20 (nominal)	1	0.26	70	70	N/A
2-Butanone (MEK)	97-179	0-20 (nominal)	5	2.74	1440	N/A	N/A
Chloroform	81-112	0-20 (nominal)	1	0.39	57	N/A	N/A
1,1,1-Trichloroethane	79-113	0-20 (nominal)	1	0.22	200	200	N/A
Carbon Tetrachloride	79-119	0-20 (nominal)	1	0.27	3	5	N/A
1,2-Dichloroethane	76-108	0-20 (nominal)	1	0.30	4	5	N/A
Bromodichloromethane	78-98	0-20 (nominal)	1	0.22	6	N/A	N/A
1,2-Dichloropropane	82-110	0-20 (nominal)	1	0.33	5	5	N/A
cis-1,3-Dichloropropene	85-114	0-20 (nominal)	1	0.29	2	N/A	N/A
Trichloroethene	85-118	0-20 (nominal)	1	0.30	32	5	N/A
Benzene	83-117	0-20 (nominal)	1	0.33	12	5	N/A
trans-1,3-Dichloropropene	91-120	0-20 (nominal)	1	0.39	2	N/A	N/A
1,1,2-Trichloroethane	79-117	0-20 (nominal)	1	0.32	6	5	N/A
4-methyl-2-pentanone(MiBK)	67-124	0-20 (nominal)	5	2.83	N/A	N/A	N/A
Toluene	84-121	0-20 (nominal)	1	0.23	1400	1000	N/A
2-Hexanone	77-122	0-20 (nominal)	5	2.59	N/A	N/A	N/A
Tetrachloroethene	73-112	0-20 (nominal)	1	0.44	7	5	N/A
Dibromochloromethane	87-112	0-20 (nominal)	1	0.42	3		N/A
Chlorobenzene	84-117	0-20 (nominal)	1	0.25	N/A	N/A	N/A
Ethylbenzene	81-115	0-20 (nominal)	1	0.25	70	700	N/A
Styrene	82-107	0-20 (nominal)	1	0.59	140	100	N/A
m+p-Xylene	87-119	0-20 (nominal)	2	0.52			N/A
o-Xylene	78-125	0-20 (nominal)	1	0.32	14000	10000	N/A
Bromoform	75-111	0-20 (nominal)	1	0.49	44	N/A	N/A
1,1,2,2-Tetrachloroethane	81-116	0-20 (nominal)	1	0.50	1.8	N/A	N/A
1,3,5-Trimethylbenzene	79-117	0-20 (nominal)	1	0.26	N/A	N/A	N/A
1,2,4-Trimethylbenzene	78-112	0-20 (nominal)	1	0.22	N/A	N/A	N/A
Naphthalene	36-143	0-20 (nominal)	1	0.44	14	N/A	N/A
Semivolatile Organic Compounds - EPA Method 8270C							
1,2,4-Trichlorobenzene	49-104	0-30 (nominal)	10	3.10	70	70	N/A
1,2-Dichlorobenzene	32-107	0-30 (nominal)	10	2.89	63	600	N/A
1,3-Dichlorobenzene	41-97	0-30 (nominal)	10	3.00	60		N/A
1,4-Dichlorobenzene	40-98	0-30 (nominal)	10	2.99	21	75	N/A
2,4,5-Trichlorophenol	61-136	0-30 (nominal)	25	7.46	N/A	N/A	N/A
2,4,6-Trichlorophenol	67-128	0-30 (nominal)	10	7.62	32	N/A	N/A
2,4-Dichlorophenol	60-125	0-30 (nominal)	10	6.34	21	N/A	N/A
2,4-Dimethylphenol	73-109	0-30 (nominal)	10	7.91	N/A	N/A	N/A
2,4-Dinitrophenol	53-130	0-30 (nominal)	25	5.21	14	N/A	N/A
2,4-Dinitrotoluene	68-120	0-30 (nominal)	10	3.88	0.5	N/A	N/A
2,6-Dinitrotoluene	71-127	0-30 (nominal)	10	2.78	0.5	N/A	N/A
2-Chloronaphthalene	53-153	0-30 (nominal)	10	2.92	N/A	N/A	N/A
2-Chlorophenol	59-127	0-30 (nominal)	10	5.15	35	N/A	N/A
2-Methylnaphthalene	64-117	0-30 (nominal)	10	4.74	N/A	N/A	N/A
2-methylphenol	59-122	0-30 (nominal)	10	5.18	N/A	N/A	N/A
2-nitroaniline	76-118	0-30 (nominal)	25	3.26	N/A	N/A	N/A
2-Nitrophenol	18-162	0-30 (nominal)	10	5.69	60	N/A	N/A

Table C-1: Detection Limits for Water/Aqueous Samples

(representative lists based on Target Compound List for organics)

Target List	Aqueous Accuracy % Recovery	Aqueous Precision RPD (1)	Water PQLs (ppb)	Water MDLs (ppb)	Maine MEGs ppb	EPA MCL ppb	AWQC ug/L
3,3'-Dichlorobenzidine	68-173	0-30 (nominal)	10	3.83	N/A	N/A	N/A
3-nitroaniline	12-178	0-30 (nominal)	25	3.05	N/A	N/A	N/A
4,6-Dinitro-2-methylphenol	61-148	0-30 (nominal)	25	10.07	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	65-149	0-30 (nominal)	10	4.65	N/A	N/A	N/A
4-Chloro-3-methylphenol	74-120	0-30 (nominal)	10	5.89	N/A	N/A	N/A
4-chloroaniline	21-142	0-30 (nominal)	10	3.80	N/A	N/A	N/A
4-Chlorophenyl Phenyl Ether	61-134	0-30 (nominal)	10	3.34	N/A	N/A	N/A
4-methylphenol	46-139	0-30 (nominal)	10	5.15	3.5	N/A	N/A
4-nitroaniline	32-157	0-30 (nominal)	25	5.15	N/A	N/A	N/A
4-Nitrophenol	0-169(nominal)	0-30 (nominal)	25	5.59	60	N/A	N/A
Acenaphthylene	46-118	0-30 (nominal)	10	2.89	N/A	N/A	N/A
Acenapthene	64-122	0-30 (nominal)	10	2.54	N/A	N/A	N/A
Anthracene	73-136	0-30 (nominal)	10	3.38	N/A	N/A	N/A
Benzo (a) Anthracene	62-131	0-30 (nominal)	10	2.94	N/A	N/A	N/A
Benzo (a) Pyrene	61-130	0-30 (nominal)	10	2.52	0.05	0.2	N/A
Benzo (b) Fluoranthene	64-130	0-30 (nominal)	10	2.36	N/A	N/A	N/A
Benzo (g,h,i) Perylene	34-154	0-30 (nominal)	10	2.33	N/A	N/A	N/A
Benzo(k)Fluoranthene	70-154	0-30 (nominal)	10	2.93	N/A	N/A	N/A
Bis (2-Chloroethoxy)Methane	60-122	0-30 (nominal)	10	2.67	N/A	N/A	N/A
Bis (2-Chloroethyl) Ether	51-125	0-30 (nominal)	10	2.92	0.3	N/A	N/A
Bis (2-Ethylhexyl)Phthalate	49-150	0-30 (nominal)	10	7.72	N/A	N/A	N/A
Butyl Benzylphthalate	60-130	0-30 (nominal)	10	3.24	N/A	N/A	N/A
Carbazole	36-170	0-30 (nominal)	10	3.89	N/A	N/A	N/A
Chrysene	64-127	0-30 (nominal)	10	3.45	N/A	N/A	N/A
Dibenz (a,h) Anthracene	44-148	0-30 (nominal)	10	2.55	N/A	N/A	N/A
Dibenzofuran	73-120	0-30 (nominal)	10	3.56	N/A	N/A	N/A
Diethyl Phthalate	70-120	0-30 (nominal)	10	2.24	5000	N/A	N/A
Dimethyl Phthalate	38-131	0-30 (nominal)	10	3.33	N/A	N/A	N/A
Di-n-Butylphthalate	67-137	0-30 (nominal)	10	2.32	700	N/A	N/A
Di-n-Octyl Phthalate	58-147	0-30 (nominal)	10	3.42	N/A	N/A	N/A
Fluoranthene	73-135	0-30 (nominal)	10	2.93	N/A	N/A	N/A
Fluorene	68-126	0-30 (nominal)	10	2.69	N/A	N/A	N/A
Hexachlorobenzene	57-154	0-30 (nominal)	10	3.98	0.2	1	N/A
Hexachlorobutadiene	37-102	0-30 (nominal)	10	4.14	4	N/A	N/A
Hexachlorocyclopentadiene	6-67	0-30 (nominal)	10	2.06	50	50	N/A
Hexachloroethane	23-98	0-30 (nominal)	10	2.34	7	N/A	N/A
Indeno (1,2,3-c,d) Pyrene	37-161	0-30 (nominal)	10	2.57	N/A	N/A	N/A
Isophorone	59-114	0-30 (nominal)	10	2.48	370	N/A	N/A
Naphthalene	58-116	0-30 (nominal)	10	2.70	14	N/A	N/A
Nitrobenzene	66-114	0-30 (nominal)	10	2.63	3.5	N/A	N/A
n-Nitrosodiphenylamine	31-177	0-30 (nominal)	10	8.51	N/A	N/A	N/A
n-Nitrosodipropylamine	55-109	0-30 (nominal)	10	2.46	N/A	N/A	N/A
Pentachlorophenol	25-173	0-30 (nominal)	25	9.35	3	1	N/A
Phenanthrene	73-141	0-30 (nominal)	10	3.05	N/A	N/A	N/A
Phenol	30-140(nominal)	0-30 (nominal)	10	5.87	4000	N/A	N/A
Pyrene	55-154	0-30 (nominal)	10	4.08	N/A	N/A	N/A
Metals - EPA Method 6010							
Antimony	80-120 (nominal)	0-20 (nominal)	8	3.93	3	6	N/A
Arsenic	80-120 (nominal)	0-20 (nominal)	8	2.21	10	50	340
Beryllium	80-120 (nominal)	0-20 (nominal)	5	0.231	N/A	N/A	N/A
Cadmium	80-120 (nominal)	0-20 (nominal)	10	3.1	3.5	5	2
Chromium	80-120 (nominal)	0-20 (nominal)	15	1.005	40	100	16
Copper	80-120 (nominal)	0-20 (nominal)	25	2.96	1300	1300	13
Lead	80-120 (nominal)	0-20 (nominal)	5	1.73	10	15	65
Mercury	80-120 (nominal)	0-20 (nominal)	0.20	0.010	2	2	1.4
Nickel	80-120 (nominal)	0-20 (nominal)	40	9.01	140	N/A	470
Selenium	80-120 (nominal)	0-20 (nominal)	10	3.5	35	50	N/A

Table C-1: Detection Limits for Water/Aqueous Samples

(representative lists based on Target Compound List for organics)

Target List	Aqueous Accuracy % Recovery	Aqueous Precision RPD (1)	Water PQLs (ppb)	Water MDLs (ppb)	Maine MEGs ppb	EPA MCL ppb	AWQC ug/L
Silver	80-120 (nominal)	0-20 (nominal)	15	4.84	35	N/A	3.2
Thallium	80-120 (nominal)	0-20 (nominal)	15	4.71	0.5	2	N/A
Zinc	80-120 (nominal)	0-20 (nominal)	25	2.01	2000	N/A	120
Polychorinated Biphenyls - EPA Method 8082							
Aroclor 1221	---	---	0.5	0.26	0.5	0.5	N/A
Aroclor 1232	---	---	0.5	0.29	0.5	0.5	N/A
Aroclor 1242	---	---	0.5	0.22	0.5	0.5	N/A
Aroclor 1248	---	---	0.5	0.10	0.5	0.5	N/A
Aroclor 1254	---	---	0.5	0.25	0.5	0.5	N/A
Aroclor 1016	51-146	0-30 (nominal)	0.5	0.13	0.5	0.5	N/A
Aroclor 1260	63-132	0-30 (nominal)	0.5	0.06	0.5	0.5	N/A

Note: **Bolded** substances are those where the PQL is less than 3 times greater than the regulatory guideline/standard.
N/A - Not Available (standard and/or guideline not established)

1. Represented as Relative Percent Difference
2. Accuracy is determined by Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicates.
3. Accuracy for metals for MS/MSD only applies when the spike is > 4X the native analyte concentration.
4. Practical Quantitation Limits (PQLs) can increase based on percent water content and/or dilution factors.

Table C-2 - Detection Limits for Soil/Solid Samples

(Partial List for VOCs/SVOCs Based on Target Compound List)

Target List	Soil Accuracy % Recovery	Soil Precision RPD (1)	Soil PQLs (ppb)	Soil MDLs (ppb)	Maine RAG Residential	EPA PRG Residential	EPA SSL DAF 1
Petroleum Hydrocarbons - Maine Methods 4.1.25 and 4.2.17					mg/kg (ppm)		
Diesel Range Organics	56-125	0-50 (nominal)	5000	1120	N/A	N/A	N/A
Gasoline Range Organics	56-140	0-50 (nominal)	2500	490	N/A	N/A	N/A
Volatile Organic Compounds - EPA Method 8260							
Chloromethane	36-165	0-30 (nominal)	5	0.97	13	47	N/A
Bromomethane	43-181	0-30 (nominal)	5	2.00	N/A	3.9	0.01
Vinyl Chloride	47-159	0-30 (nominal)	5	1.80	0.04	0.07	0.01
Chloroethane	54-157	0-30 (nominal)	5	1.48	N/A	3	N/A
Acetone	44-226	0-30 (nominal)	25	4.17	475	14000	16
Acrolein	44-146	0-30 (nominal)	25	2.58	N/A	0.1	N/A
1,1-Dichloroethene	68-141	0-30 (nominal)	5	1.00	0.2	120	0.06
Methyl tert-butyl ether	11-259	0-30 (nominal)	10	0.66	N/A	32	N/A
1,2-Dichloroethene (trans)	72-133	0-30 (nominal)	5	0.90	135	69	0.03
1,1-Dichloroethane	75-130	0-30 (nominal)	5	1.06	645	510	1
1,2-Dichloroethene (cis)	67-129	0-30 (nominal)	5	0.68	N/A	43	0.02
2-Butanone (MEK)	22-267	0-30 (nominal)	25	3.15	10000	22000	N/A
Chloroform	73-127	0-30 (nominal)	5	0.84	N/A	0.22	0.03
1,1,1-Trichloroethane	71-129	0-30 (nominal)	5	1.33	260	1200	0.1
Carbon Tetrachloride	75-130	0-30 (nominal)	5	3.03	N/A	0.25	0.003
1,2-Dichloroethane	80-123	0-30 (nominal)	5	0.59	N/A	0.28	0.001
Bromodichloromethane	78-107	0-30 (nominal)	5	0.52	N/A	0.82	0.03
1,2-Dichloropropane	77-123	0-30 (nominal)	5	0.73	N/A	0.34	0.001
cis-1,3-Dichloropropene	76-125	0-30 (nominal)	5	0.33	N/A	100	N/A
Trichloroethene	75-136	0-30 (nominal)	5	0.77	19	0.053	0.003
Benzene	76-123	0-30 (nominal)	5	0.83	5	0.64	0.002
trans-1,3-Dichloropropene	80-136	0-30 (nominal)	5	0.56	N/A	0.78	0.0004
1,1,2-Trichloroethane	76-120	0-30 (nominal)	5	0.76	3	1200	0.1
4-methyl-2-pentanone(MiBK)	69-148	0-30 (nominal)	25	4.23	N/A	N/A	N/A
Toluene	76-121	0-30 (nominal)	5	0.87	2390	520	0.6
2-Hexanone	67-157	0-30 (nominal)	25	4.05	N/A	N/A	N/A
Tetrachloroethene	87-114	0-30 (nominal)	5	1.23	3	0.48	0.003
Dibromochloromethane	87-114	0-30 (nominal)	5	0.52	N/A	1.1	0.02
Chlorobenzene	90-111	0-30 (nominal)	5	0.66	310	150	0.07
Ethylbenzene	89-111	0-30 (nominal)	5	0.76	1670	400	0.7
Styrene	85-114	0-30 (nominal)	5	0.32	N/A	1700	0.2
m+p-Xylene	91-113	0-30 (nominal)	10	1.29			
o-Xylene	91-112	0-30 (nominal)	5	0.63	10000	270	10
Bromoform	92-113	0-30 (nominal)	5	0.60	N/A	62	0.04
1,1,2,2-Tetrachloroethane	77-119	0-30 (nominal)	5	1.13	N/A	0.41	0.0002
1,3,5-Trimethylbenzene	84-117	0-30 (nominal)	5	0.64	N/A	21	N/A
1,2,4-Trimethylbenzene	83-118	0-30 (nominal)	5	0.56	N/A	52	N/A
Naphthalene	72-117	0-30 (nominal)	5	1.56	245	56	4
Semivolatile Organic Compounds - EPA Method 8270							
1,2,4-Trichlorobenzene	53-115	0-50 (nominal)	330	43.70	540	62	0.3
1,2-Dichlorobenzene	38-113	0-50 (nominal)	330	42.65	2670	600	0.9
1,3-Dichlorobenzene	45-110	0-50 (nominal)	330	52.80	N/A	530	N/A
1,4-Dichlorobenzene	44-111	0-50 (nominal)	330	25.17	N/A	3.4	N/A
2,4,5-Trichlorophenol	62-124	0-50 (nominal)	820	179.61	N/A	6100	14
2,4,6-Trichlorophenol	62-120	0-50 (nominal)	330	117.18	N/A	6.1	0.008
2,4-Dichlorophenol	59-116	0-50 (nominal)	330	133.85	16	180	0.05
2,4-Dimethylphenol	54-113	0-50 (nominal)	330	117.28	N/A	1200	0.4
2,4-Dinitrophenol	3-118	0-50 (nominal)	820	61.82	N/A	120	0.01

Target List	Soil Accuracy % Recovery	Soil Precision RPD (1)	Soil PQLs (ppb)	Soil MDLs (ppb)	Maine RAG Residential	EPA PRG Residential	EPA SSL DAF 1
2,4-Dinitrotoluene	60-125	0-50 (nominal)	330	97.50	N/A	120	0.00004
2,6-Dinitrotoluene	66-127	0-50 (nominal)	330	77.17	N/A	61	0.00003
2-Chloronaphthalene	42-160	0-50 (nominal)	330	48.20	N/A	4900	N/A
2-Chlorophenol	60-118	0-50 (nominal)	330	89.98	N/A	63	0.2
2-Methylnaphthalene	61-122	0-50 (nominal)	330	56.82	N/A	N/A	N/A
2-methylphenol	53-121	0-50 (nominal)	330	135.99	N/A	3100	0.8
2-nitroaniline	66-121	0-50 (nominal)	820	74.92	N/A	180	N/A
2-Nitrophenol	57-120	0-50 (nominal)	330	106.91	N/A	N/A	N/A
3,3'-Dichlorobenzidine	38-137	0-50 (nominal)	330	133.26	N/A	1.1	0.0003
3-nitroaniline	57-120	0-50 (nominal)	820	71.42	N/A	18	N/A
4,6-Dinitro-2-methylphenol	46-125	0-50 (nominal)	820	119.13	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	67-138	0-50 (nominal)	330	55.52	N/A	N/A	N/A
4-Chloro-3-methylphenol	62-126	0-50 (nominal)	330	118.30	N/A	N/A	N/A
4-chloroaniline	20-120(nominal)	0-50 (nominal)	330	53.44	N/A	240	0.03
4-Chlorophenyl Phenyl Ether	53-133	0-50 (nominal)	330	50.26	N/A	N/A	N/A
4-methylphenol	59-127	0-50 (nominal)	330	149.94	N/A	310	N/A
4-nitroaniline	62-125	0-50 (nominal)	820	69.19	N/A	23	N/A
4-Nitrophenol	41-149	0-50 (nominal)	820	154.96	N/A	N/A	N/A
Acenaphthylene	47-117	0-50 (nominal)	330	40.39	N/A	N/A	N/A
Acenapthene	54-122	0-50 (nominal)	330	59.74	N/A	3700	29
Anthracene	70-131	0-50 (nominal)	330	57.97	N/A	2200	590
Benzo (a) Anthracene	54-135	0-50 (nominal)	330	59.01	N/A	0.62	0.08
Benzo (a) Pyrene	52-135	0-50 (nominal)	330	45.26	2	0.062	0.4
Benzo (b) Fluoranthene	47-136	0-50 (nominal)	330	63.86	N/A	0.62	0.2
Benzo (g,h,i) Perylene	40-147	0-50 (nominal)	330	129.42	N/A	N/A	N/A
Benzo(k)Fluoranthene	49-150	0-50 (nominal)	330	58.77	N/A	6.2	2
Bis (2-Chloroethoxy)Methane	50-117	0-50 (nominal)	330	52.48	N/A	N/A	N/A
Bis (2-Chloroethyl) Ether	54-114	0-50 (nominal)	330	32.90	N/A	0.22	0.00002
Bis (2-Ethylhexyl)Phthalate	45-154	0-50 (nominal)	330	74.40	1220	35	3600
Butyl Benzylphthalate	44-155	0-50 (nominal)	330	67.97	N/A	1200	810
Carbazole	78-133	0-50 (nominal)	330	60.07	N/A	24	0.03
Chrysene	55-129	0-50 (nominal)	330	65.80	N/A	62	8
Dibenz (a,h) Anthracene	42-155	0-50 (nominal)	330	140.86	N/A	0.062	0.08
Dibenzofuran	66-119	0-50 (nominal)	330	62.07	N/A	150	N/A
Diethyl Phthalate	57-135	0-50 (nominal)	330	103.49	N/A	49000	N/A
Dimethyl Phthalate	56-133	0-50 (nominal)	330	62.30	N/A	100000	N/A
Di-n-Butylphthalate	65-139	0-50 (nominal)	330	84.19	N/A	6100	270
Di-n-Octyl Phthalate	53-143	0-50 (nominal)	330	73.67	N/A	2400	10000
Fluoranthene	69-133	0-50 (nominal)	330	70.91	N/A	2300	210
Fluorene	54-128	0-50 (nominal)	330	52.66	N/A	2700	28
Hexachlorobenzene	63-131	0-50 (nominal)	330	233.01	N/A	0.3	0.1
Hexachlorobutadiene	53-114	0-50 (nominal)	330	43.79	N/A	6.2	0.1
Hexachlorocyclopentadiene	28-73	0-50 (nominal)	330	74.94	N/A	370	20
Hexachloroethane	40-99	0-50 (nominal)	330	60.74	N/A	35	0.02
Indeno (1,2,3-c,d) Pyrene	43-142	0-50 (nominal)	330	133.00	N/A	0.62	0.7
Isophorone	46-112	0-50 (nominal)	330	51.90	N/A	510	0.03
Naphthalene	49-125	0-50 (nominal)	330	63.60	245	56	4
Nitrobenzene	49-113	0-50 (nominal)	330	74.24	N/A	20	0.007
n-Nitrosodiphenylamine	70-131	0-50 (nominal)	330	71.88	N/A	99	0.06
n-Nitrosodipropylamine	36-115	0-50 (nominal)	330	56.28	N/A	0.069	0.000002
Pentachlorophenol	54-131	0-50 (nominal)	820	140.54	1	3	0.001
Phenanthrene	69-133	0-50 (nominal)	330	57.55	N/A	N/A	N/A
Phenol	48-116	0-50 (nominal)	330	91.45	N/A	18000	5
Pyrene	58-141	0-50 (nominal)	330	71.94	N/A	2300	210
RCRA Metals - EPA Method 6010							

Target List	Soil Accuracy % Recovery	Soil Precision RPD (1)	Soil PQLs (ppb)	Soil MDLs (ppb)	Maine RAG Residential	EPA PRG Residential	EPA SSL DAF 1
Arsenic	79-121	0-20 (nominal)	800	275	10	N/A	29
Barium	80-120	0-20 (nominal)	500	156	10000	5400	82
Cadmium	81-119	0-20 (nominal)	1000	288	27	37	0.4
Chromium	76-123	0-20 (nominal)	1500	75	950	30	2
Lead	78-122	0-20 (nominal)	500	16	375	400	700
Mercury	66-134	0-20 (nominal)	40	6.12	60	23	2
Selenium	72-128	0-20 (nominal)	1000	530	950	390	0.3
Silver	55-145	0-20 (nominal)	1500	330	950	390	2

1. Represented as Relative Percent Difference
2. Accuracy is determined by Laboratory Control Samples and Matrix Spike/Matrix Spike Duplicates.
3. Accuracy for metals for MS/MSD only applies when the spike is > 4X the native analyte concentration.
4. Practical Quantitation Limits (PQLs) can increase based on percent water content and/or dilution factors.

B-1 SEDIMENT BARRIERS

PURPOSE & APPLICATIONS

A sediment barrier is a temporary barrier installed across or at the toe of a slope. Sediment barriers may consist of filter fence, straw or hay bales, a berm of erosion control mix, or other filter materials. Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas.

The sediment barrier is used where:

- Sedimentation can pollute or degrade adjacent wetland and/or watercourses.
- Sedimentation will reduce the capacity of storm drainage systems or adversely affect adjacent areas.
- The contributing drainage area is less than 1/4 acre per 100 ft of barrier length, the maximum length of slope above the barrier is 100 feet, and the maximum gradient behind the barrier is 50 percent (2:1). If the slope length is greater, other measures such as diversions may be necessary to reduce the slope length.
- Sediment barriers shall not be used in areas of concentrated flows. Under no circumstances should hay bale or erosion control mix barriers be constructed in live streams or in swales where there is the possibility of a washout.

CONSIDERATIONS

- Sediment barriers are effective only if installed and maintained properly.
- Silt fencing generally is a better filter than hay bale barriers.
- If there is evidence of end flow on properly installed barriers, extend barriers uphill or consider replacing them with temporary check dams.
- Straw or hay bales should only be used as a temporary barrier for no longer than 60 days.
- Silt fences (synthetic filter) can be used for 60 days or longer depending on ultraviolet stability and manufacturer's recommendations.
- Sediment barriers should be installed prior to any soil disturbance of the contributing drainage area above them.

SPECIFICATIONS

Filter Fences

This sediment barrier utilizes synthetic filter fabrics. It is designed for situations in which only sheet or overland flows are expected. Generally pre-manufactured synthetic silt fencing with posts attached is used. See the detail drawing located at the back of this section for the proper installation of silt fences.

- The filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier.
- The filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F.
- Posts for silt fences shall be either 4-inch diameter wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.
- The height of a silt fence should not exceed 36 inches as higher fences may impound volumes of water sufficient to cause failure of the structure.
- The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at support post, with a minimum 6-inch overlap, and securely sealed.
- Post spacing shall not exceed 6 feet.

- A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upgradient from the barrier.
- The standard strength of filter fabric shall be stapled or wired to the post, and 8 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- The trench shall be backfilled and the soil compacted over the filter fabric.
- Silt fences shall be removed when they have served their useful purpose, but not before the upslope areas have been permanently stabilized.

Straw/Hay Bales

See the detail drawing located at the back of this section for the proper installation of hay bales.

- Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
- All bales shall be either wire-bound or string-tied. Bales shall be installed so that bindings are oriented around the sides, parallel to the ground surface to prevent deterioration of the bindings.
- The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches.
- After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be build up to 4 inches against the uphill side of the barrier. Ideally, bales should be placed 10 feet away from the toe of slope.
- At least two stakes or rebars driven through the bale shall securely anchor each bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re-bars shall be driven deep enough into the ground to securely anchor the bales.
- The gaps between bales shall be chinked (filled by wedging) with hay to prevent water from escaping between the bales.

Problems with Straw or Hay Bale Barriers

There are three major reasons why straw bale barriers are not as effective as hoped they would be:

- When improperly placed and installed (such as staking the bales directly to the ground with no soil seal or entrenchment), hay bales allow undercutting and end flow.
- Inadequate maintenance.
- Inspection shall be frequent and repair or replacement shall be made promptly as needed. Bale barriers shall be removed when they have served their usefulness, but not before the up-slope areas have been permanently stabilized.

Erosion Control Mix Berms

Erosion control mix can be manufactured on or off the project site. It must consist primarily of organic material, separated at the point of generation, and may include: shredded bark, stump grindings, composted bark, or acceptable manufactured products. Wood and bark chips, ground construction debris or reprocessed wood products will not be acceptable as the organic component of the mix.

Composition

Erosion control mix shall contain a well-graded mixture of particle sizes and may contain rocks less than 4" in diameter. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth. The mix composition shall meet the following standards:

- The organic matter content shall be between 80 and 100%, dry weight basis.
- Particle size by weight shall be 100 % passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen.
- The organic portion needs to be fibrous and elongated.
- Large portions of silts, clays or fine sands are not acceptable in the mix.
- Soluble salts content shall be < 4.0 mmhos/cm.

- The pH should fall between 5.0 and 8.0.

Installation

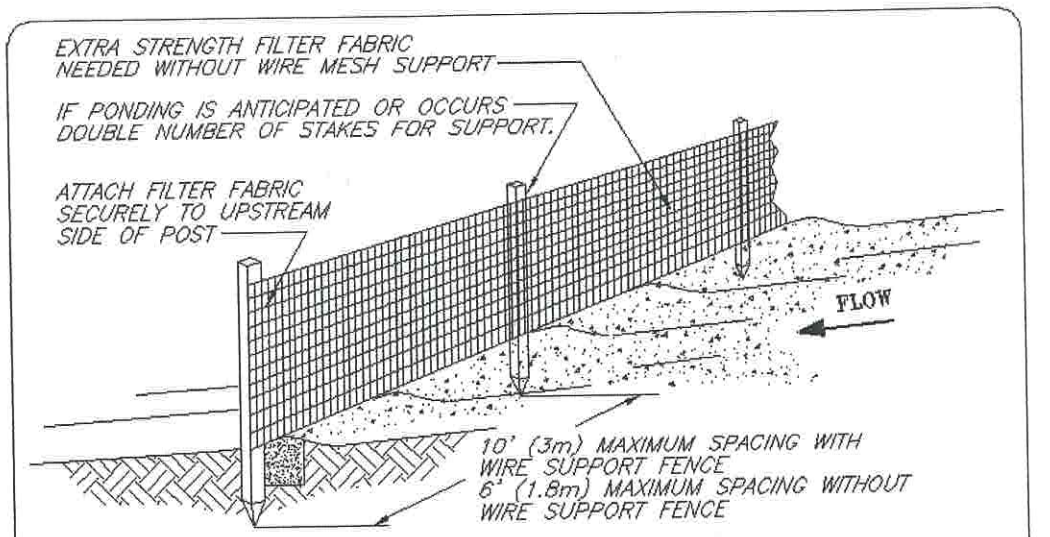
- The barrier must be placed along a relatively level contour. It may be necessary to cut tall grasses or woody vegetation to avoid creating voids and bridges that would enable fines to wash under the barrier through the grass blades or plant stems.
- On slopes less than 5 % *or* at the bottom of steeper slopes (<2:1) up to 20 feet long, the barrier must be *a minimum of* 12" high, as measured on the uphill side of the barrier, *and a minimum* of two feet wide. *On longer or steeper slopes,* the barrier should be wider to accommodate the additional runoff.
- Frozen ground, outcrops of bedrock and very rooted forested areas are locations where berms of erosion control mix are most practical and effective.
- Other BMPs should be used at low points of concentrated runoff, below culvert outlet aprons, around catch basins and closed storm systems, and at the bottom of steep perimeter slopes that are more than 50 feet from top to bottom (i.e., a large up gradient contributing watershed).

Continuous Contained Berms

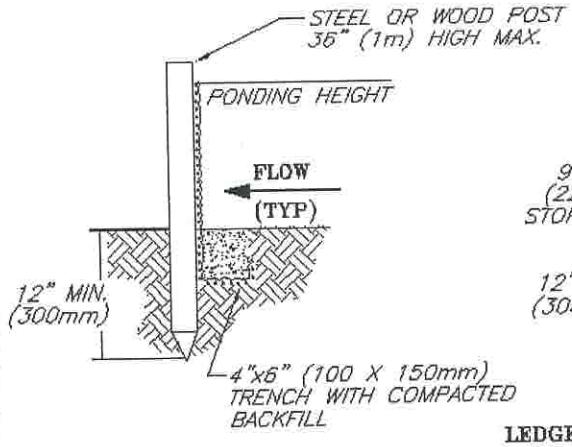
A new product, the filter sock can be an effective sediment barriers as it adds containment and stability to a berm of erosion control mix. The organic mix is placed in the synthetic tubular netting and performs as a sturdy sediment barrier (a vehicle may drive over it without ill effect). It works well in areas where trenching is not feasible such as over frozen ground or over pavement. A continuous contained berm of erosion control mix may be effective when placed in waterways such as ditches and swales or in area of concentrated water flow as the netting prevents the movement and displacement of the organic material. See the detail drawing located at the back of this section for the proper installation of continuous contained berms.
Seeds may be added to the organic filler material and can permanently stabilize a shallow slope. The containment will provide stability while vegetation is rooting through the netting.

MAINTENANCE

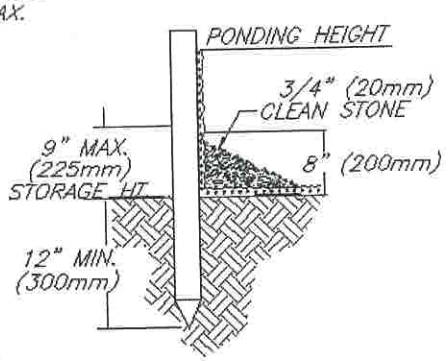
- Hay bale barriers, silt fences and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired immediately if there are any signs of erosion or sedimentation below them. If there are signs of undercutting at the center or the edges of the barrier, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.
- Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
- Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
- Filter berms should be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared and seeded.



NOTE: PRE-FABRICATED SILT FENCE IS ACCEPTABLE IF INSTALLED PER MANUFACTURER.



TRENCH DETAIL



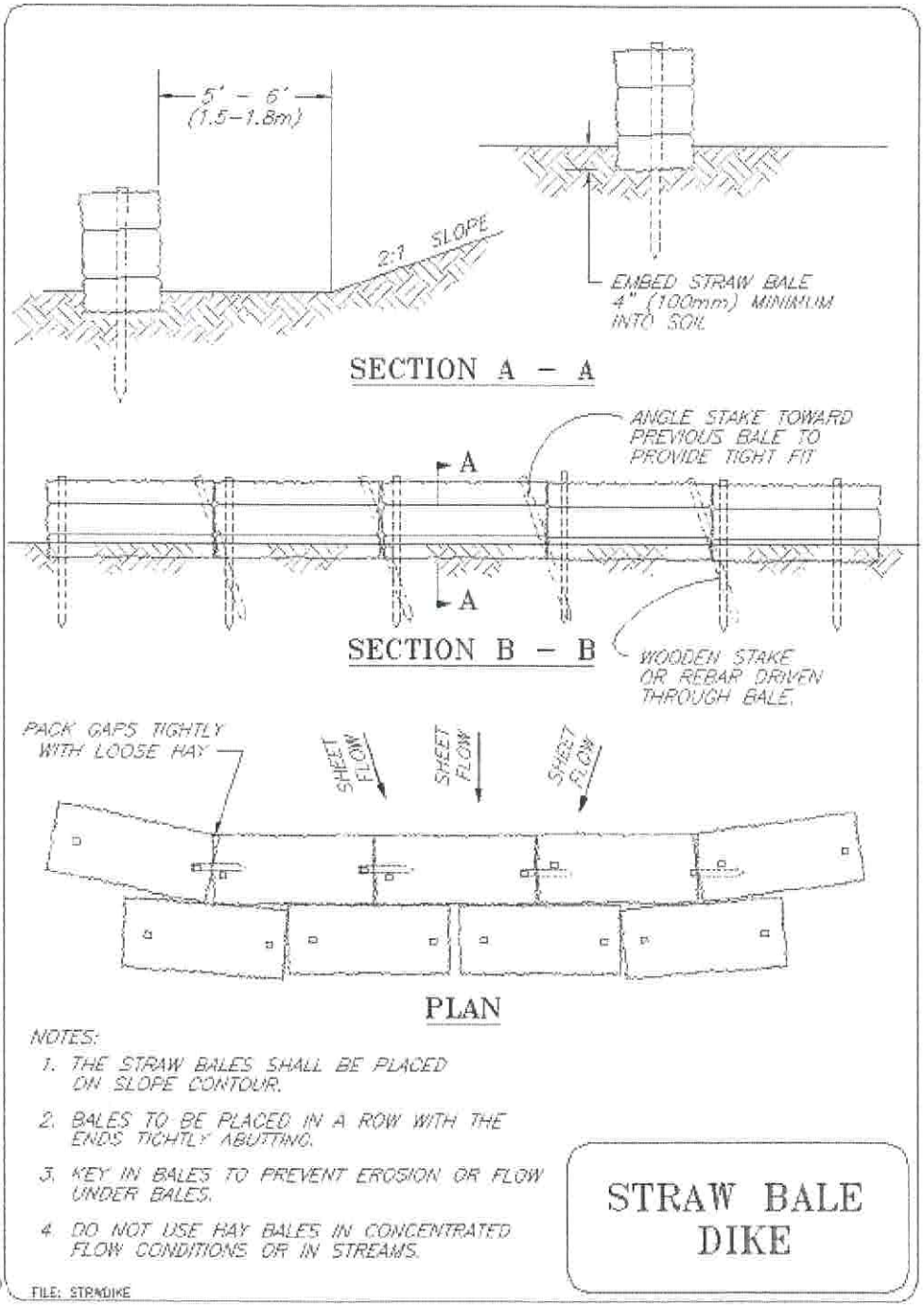
LEDGE, FROZEN GROUND, HEAVY ROOTS
INSTALLATION WITHOUT TRENCHING

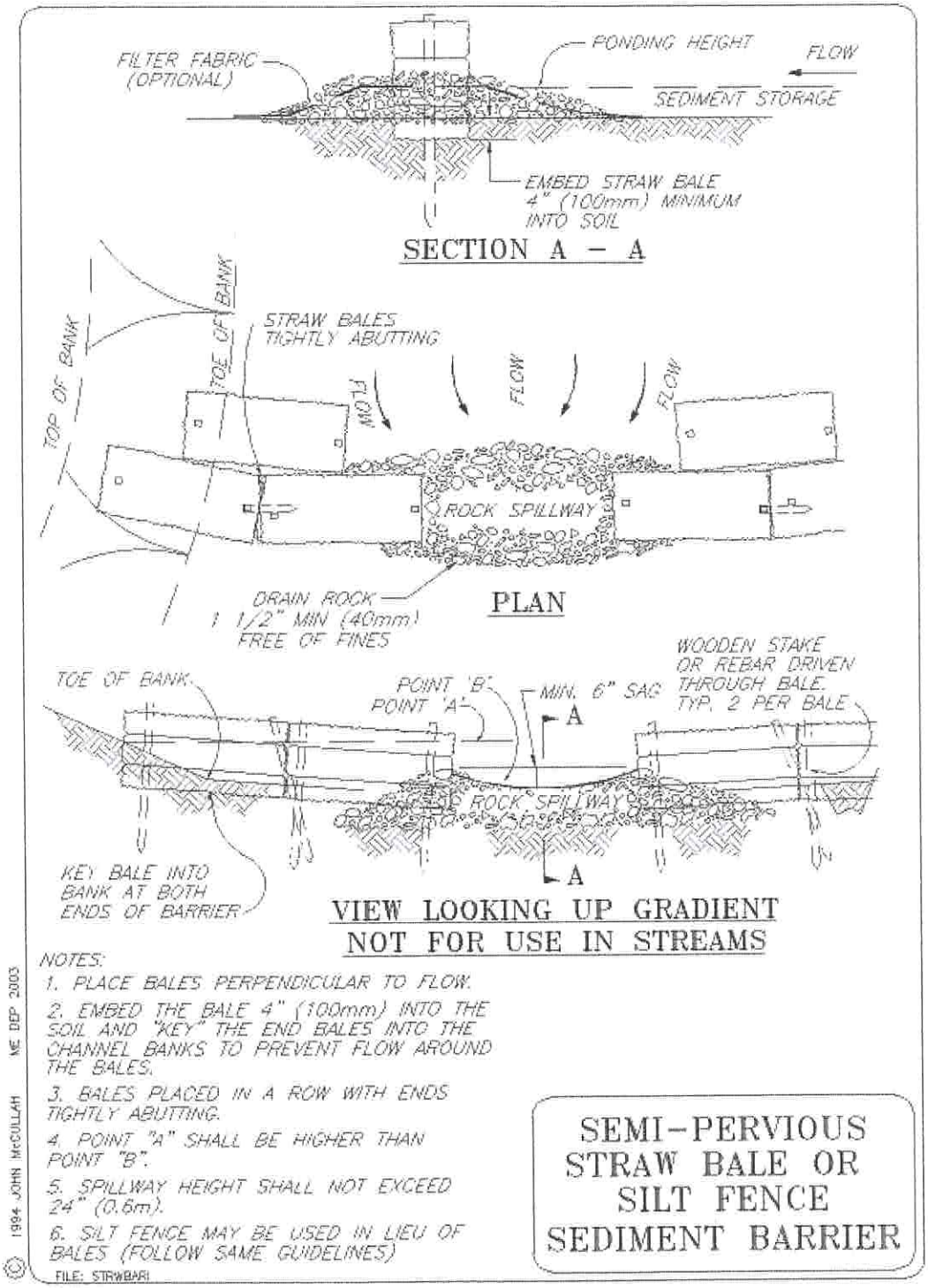
NOTES:

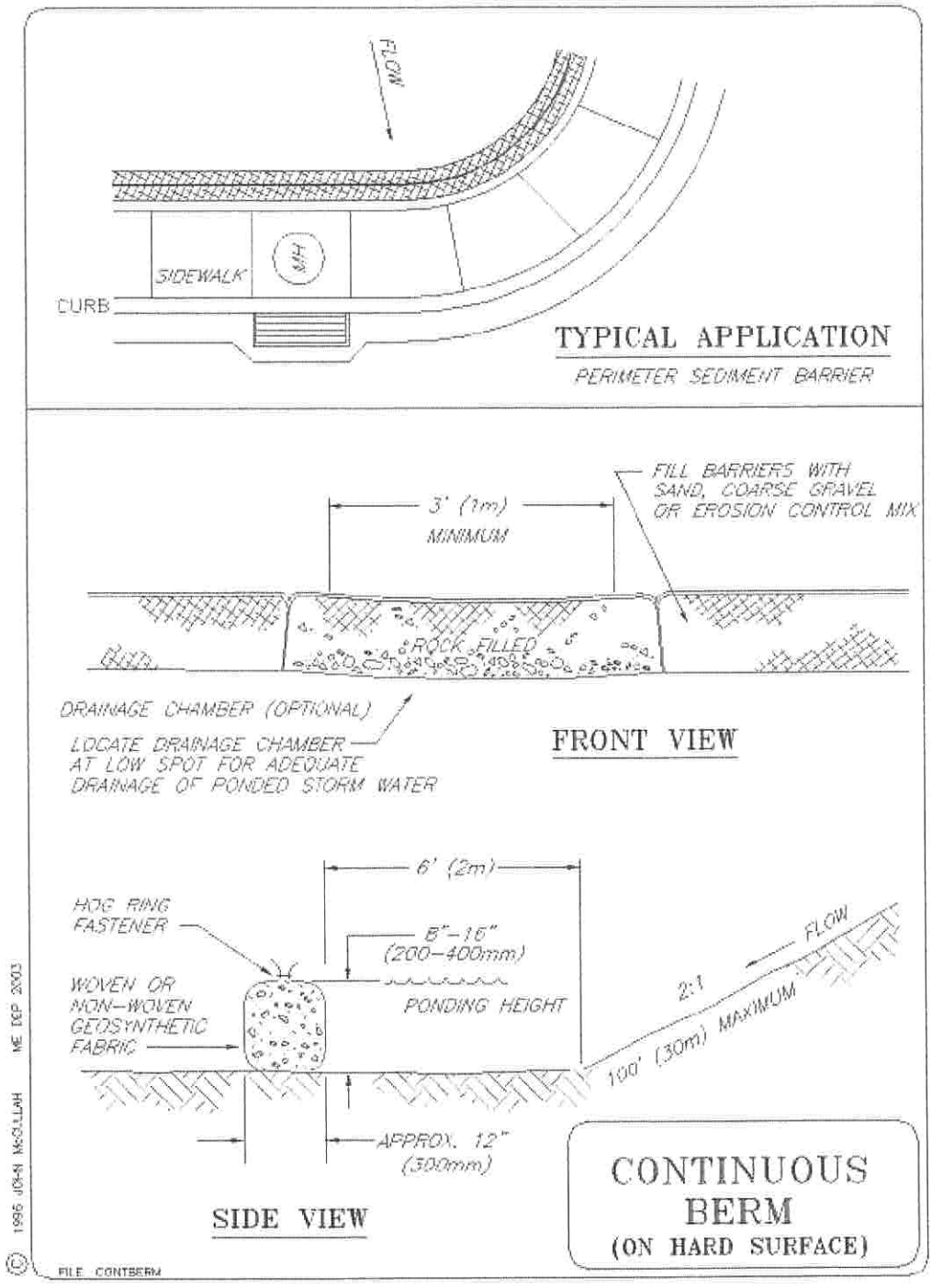
1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" (225mm) MAXIMUM RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
4. DO NOT PLACE SILT FENCE IN STREAMS OR CONCENTRATED FLOW CONDITIONS.

SILT FENCE

FILE: SILTFENC


5' - 6'
(1.5-1.8m)
2:1 SLOPE
EMBED STRAW BALE
4" (100mm) MINIMUM
INTO SOIL
SECTION A - A
ANGLE STAKE TOWARD
PREVIOUS BALE TO
PROVIDE TIGHT FIT
A
A
SECTION B - B
WOODEN STAKE
OR REBAR DRIVEN
THROUGH BALE.
PACK GAPS TIGHTLY
WITH LOOSE HAY
SHEET FLOW
SHEET FLOW
SHEET FLOW
PLAN
NOTES:
1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.
3. KEY IN BALES TO PREVENT EROSION OR FLOW UNDER BALES.
4. DO NOT USE HAY BALES IN CONCENTRATED FLOW CONDITIONS OR IN STREAMS.
STRAW BALE DIKE
© 1994 JOHN McCULLAH WE DEP 2003
FILE: STRWDIKE


FILTER FABRIC (OPTIONAL)
PONDING HEIGHT
FLOW
SEDIMENT STORAGE
EMBED STRAW BALE 4" (100mm) MINIMUM INTO SOIL
SECTION A – A
TOP OF BANK
TOE OF BANK
STRAW BALES TIGHTLY ABUTTING
FLOW
FLOW
FLOW
ROCK SPILLWAY
DRAIN ROCK 1 1/2" MIN (40mm) FREE OF FINES
PLAN
TOE OF BANK
POINT 'B'
POINT 'A'
MIN. 6" SAG
A
WOODEN STAKE OR REBAR DRIVEN THROUGH BALE. TYP. 2 PER BALE
ROCK SPILLWAY
A
KEY BALE INTO BANK AT BOTH ENDS OF BARRIER
VIEW LOOKING UP GRADIENT
NOT FOR USE IN STREAMS
NOTES:
1. PLACE BALES PERPENDICULAR TO FLOW.
2. EMBED THE BALE 4" (100mm) INTO THE SOIL AND "KEY" THE END BALES INTO THE CHANNEL BANKS TO PREVENT FLOW AROUND THE BALES.
3. BALES PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING.
4. POINT "A" SHALL BE HIGHER THAN POINT "B".
5. SPILLWAY HEIGHT SHALL NOT EXCEED 24" (0.6m).
6. SILT FENCE MAY BE USED IN LIEU OF BALES (FOLLOW SAME GUIDELINES)
© 1994 JOHN McCULLAH ME DEP 2003
FILE: STRWBARI
SEMI-PERVIOUS STRAW BALE OR SILT FENCE SEDIMENT BARRIER


FLOW
SIDEWALK
M/H
CURB
TYPICAL APPLICATION
PERIMETER SEDIMENT BARRIER
FILL BARRIERS WITH SAND, COARSE GRAVEL OR EROSION CONTROL MIX
3' (1m) MINIMUM
ROCK FILLED
DRAINAGE CHAMBER (OPTIONAL)
LOCATE DRAINAGE CHAMBER AT LOW SPOT FOR ADEQUATE DRAINAGE OF PONDED STORM WATER
FRONT VIEW
6' (2m)
HOG RING FASTENER
8"-16" (200-400mm)
PONDING HEIGHT
WOVEN OR NON-WOVEN GEOSYNTHETIC FABRIC
FLOW
2:1
100' (30m) MAXIMUM
APPROX. 12" (300mm)
SIDE VIEW
CONTINUOUS BERM
(ON HARD SURFACE)
© 1995 JOHN McCULLAH ME DEP 2003
FILE: CONTBERM

Department of
the Secretary of State
Bureau of Motor Vehicles

Matthew Dunlap
Secretary of State
Garry R. Hinkley
Chief of Motor Carrier Services

[redacted]
Catherine Curtis
Director of Vehicle Services

EFFECTIVE DATE: 05/01/2005
EXPIRATION DATE: 04/30/2006

MAINE IRP
INTERNATIONAL REGISTRATION PLAN

REGISTRANT INFORMATION
ACCT/FLEET/SUPP: 15433-01-000
USDOT: 1240815
LEGAL NAME: COMMERCIAL PAVING & RECYCLI
DBA NAME: COMMERCIAL PAVING & RECYCLI

COMMERCIAL PAVING & RECYCLIN
2 GIBSON ROAD
SCARBOROUGH ME 04074-

VEHICLE INFORMATION
EQUIP #: 56
MAKE: MACK
YEAR: 2002
USAGE: Truck Tractor
FUEL: Diesel

VIN: 1M2AA18Y92W148631
PLATE: 917376
YEAR DECAL: 7731160
MONTH DECAL: 0029367

STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT
MA	099000	ME	100000	NH	080000	RI	080000	VT	090000
**	******	**	******	**	******	**	******	**	******
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(207) 624-9000 x52135
(TDD) (207) 624-9105

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION

HAZARDOUS MATERIALS
CERTIFICATE OF REGISTRATION
FOR REGISTRATION YEAR 2004-2005

Registrant: COMMERCIAL PAVING & RECYCLING
REG SAUNDERS
2 GIBSON RD
SCARBOROUGH, ME 04074-0000

This certifies that the registrant is registered with the U.S. Department of Transportation as required by 49 CRF Part 107, Subpart G.

This certificate is issued under the authority of 49 U.S. C. 5108. It is unlawful to alter or falsify this document.

Reg. No: 061504 007 030M **Issued:** 06/15/04 **Expires:** 06/30/05

Record Keeping Requirements for the Registration Program

The following must be maintained at the principal place of business for a period of three years from the date of issuance of this Certificate of Registration:

(1) A copy of the registration statement filed with RSPA; and
(2) This Certificate of Registration

Each person subject to the registration requirement must furnish that person's Certificate of Registration (or a copy) and all other records and information pertaining to the information contained in the registration statement to an authorized representative or special agent of the U. S. Department of Transportation upon request.

Each motor carrier (private or for-hire) and each vessel operator subject to the registration requirement must keep a copy of the current Certificate of Registration or another document bearing the registration number identified as the "U.S. DOT Hazmat Reg. No." in each truck and truck tractor or vessel (trailers and semi-trailers not included) used to transport hazardous materials subject to the registration requirement. The Certificate of Registration or document bearing the registration number must be made available, upon request, to enforcement personnel.

For information, contact the Hazardous Materials Registration Manager, DHM-60 Research and Special Programs Administration, U.S. Department of Transportation, 400 Seventh Street, SW, Washington, DC 20590, telephone (202) 366-4109.

DEPARTMENT OF PUBLIC SAFETY
MAINE STATE POLICE
STATE HOUSE STATION # 20
AUGUSTA, MAINE 04333
Tel 207 624 8939 Fax 207 624 8945

DRIVER/VEHICLE EXAMINATION REPORT

Report Number: ME3587000915
Inspection Date: 02/23/2005
Start Time: 11:16 AM **End Time:** 11:19 AM
Insp. Level: 3-Driver Only,

COMMERCIAL PAVING & RECYCLING CO LLC
2 GIBSON RD
SCARBOROUGH, ME 04074
Phone#: **Fax#:**
USDOT#: 01240815 **ICC#:**
State#:

Driver: MERRYMAN, THOMAS D
License#: 1945267 **State:** ME
Date of Birth: 12/03/1983
CoDriver:
License#: **State:**
Date of Birth:

Location: YORK
Highway: INTERSATE 95
County: YORK

MilePost: 5 **Shipper:**
Origin: PORTSMOUTH, NH **Bill of Lading:**
Destination: SCARBOROUGH, ME **Cargo:** ASH

VEHICLE IDENTIFICATION

Unit	Type	Make	Year	State	License #	Company #	Vin #	GVWR	CVSA #	OOS#
1	TT	MACK	2002	ME	917382	69	1M2AA18Y02W148629	100,000		
2	ST	UNK		ME	A733187					

BRAKE ADJUSTMENTS No Brake Measurements Required For Level 3

VIOLATIONS

Section Code	St	Unit	OOS	Citation #	Verify	Crash	Violations Discovered
393.47		2	N	Y	N	N	Inadequate brake lining for safe stopping

Haz Mat: No HM Transported. **Placard:** No **Cargo Tank:**

Special Checks: Size & Weight; Traffic Enforcement

NOTE TO DRIVER: This rerport must be furnished to the motor carrier whose name COMMERCIAL PAVING & RECYCLING CO LLC appears at the top of this report. NOTE TO MOTOR CARRIERS: Please sign the below certification and return this report to the address which appears on the top of this report within fifteen days. Failure to return this report with the rerquired certification can result in penalties up to $500.

Signature Of Repairer X: Larry Scott Nichols Facility: CPRC/Scarborough Date: 3/2/05

* The undersigned certifies that all violations noted on this report have been corrected and action has been taken to assure compliance with the Federal Motor Carrier Safety and Hazardous Materials Regulations insofar as they are applicable to motor carriers and drivers. False certifications of the required repairs are required to be prosecuted with penalties up to $10,000.

Signature Of Motor Carrier X: Herbert L Cousens Dispatcher Date: 3-3-05

Report Prepared By: TROOPER R. NICHOLS Badge #: 003587
X_____

Copy Received By: MERRYMAN, THOMAS D
X_____

ASPEN v2.5 2/23/05 11:23 AM

DEPARTMENT OF PUBLIC SAFETY
MAINE STATE POLICE
STATE HOUSE STATION # 20
AUGUSTA, MAINE 04333
Tel 207 624 8939 Fax 207 6245 8945

DRIVER/VEHICLE EXAMINATION REPORT

Report Number: ME2480000133
Inspection Date: 12/01/2004
Start Time: 11:56 AM **End Time:** 12:04 PM
Insp. Level: 2-Walk-Around,

COMMERCIAL PAVING & RECYCLING CO LLC
2 GIBSON RD
SCARBOROUGH, ME 04074
Phone#: **Fax#:**
USDOT#: 01240815 **ICC#:**
State#:

Driver: RAPP, PAUL D
License#: 1651188 **State:** ME
Date of Birth: 04/21/1965
CoDriver:
License#: **State:**
Date of Birth:

Location: OLD TOWN
Highway: I 95
County: PENOBSCOT

MilePost: **Shipper:**
Origin: LINCOLN, ME **Bill of Lading:**
Destination: SCARBOROUGH, ME **Cargo:** Empty

VEHICLE IDENTIFICATION

Unit	Type	Make	Year	State	License #	Company #	Vin #	GVWR	CVSA #	OOS#
1	TT	MACK	1999	ME		67		90,000		
2	ST	MCKT	2003	ME	A733187	T157				

BRAKE ADJUSTMENTS: No Brake Measurements Required For Level 2

VIOLATIONS

Section Code	St	Unit	OOS	Citation #	Verify	Crash	Violations Discovered
395.8(k)(2)		D	Y	182547	N	N	Driver failing to retain previous 7 days logs

Haz Mat: No HM Transported. **Placard:** No **Cargo Tank:**

Special Checks: Traffic Enforcement

* Pursuant to authority contained in Title 49, Code of Federal Regulations, Section 395.13, I hereby notify and declare @Dr named on this report OUT OF SERVICE. No Motor carrier shall permit or require PAUL RAPP to drive or operate any motor vehicle until: For 10 Hours Following this Inspection. Penalties up to $10,000 are prescribed for violating this out-of-se order. (49CFR 386.82)

NOTE TO DRIVER: This rerport must be furnished to the motor carrier whose name COMMERCIAL PAVING & RECYCLING CO LLC appears at the top of this report. NOTE TO MOTOR CARRIERS: Please sign the below certification and return this report to the address which appears on the top of this report within fifteen days. Failure to return this report with the rerquired certification can result in penalties up to $500.

Signature Of Repairer X:_____ Facility:_____ Date:_____

* The undersigned certifies that all violations noted on this report have been corrected and action has been taken to assure compliance with the Federal Motor Carrier Safety and Hazardous Materials Regulations insofar as they are applicable to motor carriers and drivers. False certifications of the required repairs are required to be prosecuted with penalties up to $10,000.

Signature Of Motor Carrier X: Robert Crain Date: 12-2-04

Sent 12/2/04

Report Prepared By: TR.STANLEY D. JANDREAU Badge #: 002480
X T. Stanley D. Jandreau

Copy Received By: RAPP, PAUL D
X_____

ME2480000133

U.S. Department of
Transportation
**Federal Motor Carrier
Safety
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

April 27, 2005

In reply refer to:
Your USDOT No.: 1240815

REGGIE SAUNDERS
SAFETY AND COMPLIANCE MANAGER
COMMERCIAL PAVING & RECYCLING CO LLC
2 GIBSON RD
SCARBOROUGH ME 04074

Dear REGGIE SAUNDERS:

This letter is to inform you that, based on the results of the Safety Audit conducted on your company on March 4, 2005, the Federal Motor Carrier Safety Administration (FMCSA) has determined that you may continue to operate within the United States.

You are reminded that as a "New Entrant," the FMCSA will continue to evaluate your safety management practices and monitor your on-road performance prior to granting you permanent USDOT registration. You must maintain minimum safety standards in order to continue operating in interstate commerce during and after the 18-month period. Failure to comply with Federal Motor Carrier Safety Regulations (FMCSRs) and applicable Hazardous Materials Regulations (HMRs) may result in the revocation of your USDOT registration.

If you have any questions concerning your New Entrant Status, please call the FMCSA Information Systems Division at (202) 366-4023.

Sincerely,

Charles A. Horan, III
Director, Office of Enforcement and
Compliance

US DOT #	Legal: COMMERCIAL PAVING & RECYCLING CO LLC
1240815	Operating (DBA):

MC/MX #: **Federal Tax ID:** 20-0891985 (EIN)

Review Type: Safety Audit - New Entrant

Scope: Entire Operation **Location of Review/Audit:** Company facility in the U. S. **Territory:**

Operation Types	Interstate	Intrastate
Carrier:	HM	N/A
Shipper:	N/A	N/A
Cargo Tank:	N/A	

Business: Corporation
Gross Revenue: **for year ending:** 12/31/2004

Company Physical Address:

2 GIBSON RD
SCARBOROUGH, ME 04074

Contact Name: Reggie Saunders
Phone numbers: (1) 207-883-3325 (2) **Fax** 2078831121
E-Mail Address: rsaunders@cpcrs.com

Company Mailing Address:

2 GIBSON RD
SCARBOROUGH, ME 04074

Carrier Classification

Private Property

Cargo Classification

Machinery, Large Objects Liquids / Gases in Cargo Tanks Garbage, Refuse, Trash

Hazardous Materials

9 (Elev temp material) Carried Bulk

Does carrier transport placardable quantities of HM? Yes
Is an HM Permit required? N/A

Driver information

	Inter	Intra
< 100 Miles:		
>= 100 Miles:	5	

Average trip leased drivers/month: 0
Total Drivers: 5
CDL Drivers: 5

Equipment

	Owned	Term Leased	Trip Leased		Owned	Term Leased	Trip Leased
Truck	11	0	0	Truck Tractor	9	0	0
Trailer	22	0	0				

1.

MNHWTLN (For Department Use Only)

STATE OF MAINE APPLICATION / LICENSE FOR TRANSPORTATION OF NONHAZARDOUS WASTE

2. STATE	3. YEAR - MAKE	4. VEHICLE I.D. NO.
MAINE	Fleet	Fleet

FOR TWO OR MORE VEHICLES, USE SEPERATE FORMS OR ATTACH THE FLEET APPLICATION FORM

6. APPLICANT NAME: K-B CORPORATION
7. COMPANY NAME: SAME
8. ADDRESS: 101 ColdBrook RD. PO Box 197
9. CITY / TOWN: HAMPDEN
10. STATE: MAINE 11. ZIP CODE: 04444
12. TELEPHONE NUMBER: 207 862-6101
13. FEDERAL I.D. NUMBER: 01-0439000

5.
- ☐ NEW APPLICATION
- ☑ RENEWAL
- ☐ TRANSFER
- ☐ DELETION

14. CHECK ONE: ☐ SOLE PROPRIETOR ☐ PARTNERSHIP ☑ CORPORATION ☐ MUNICIPALITY ☐ COUNTY ☐ STATE GOVERNMENT ☐ FEDERAL GOVERNMENT ☐ OTHER: ______

15. CATEGORY OF WASTE TO BE TRANSPORTED IN THE ABOVE VEHICLE(S):
- ☑ CATEGORY A -- SPECIAL WASTE (Used tires, Construction / Demolition Debris)
- ☐ CATEGORY B -- MUNICIPAL SOLID WASTE (Other than Category A Waste)
- ☐ CATEGORY C -- SEPTAGE AND HOLDING TANK WASTE (APPROVED FOR ALTERNATE MANIFEST)

16. LIABILITY INSURANCE PROVIDER: Cross INS Agency / National Casualty INS.
17. MAXIMUM AMOUNT OF COVERAGE: $ 1,000,000.00
18. FEES SUBMITTED: $ 2,000.00

FEES MUST BE SUBMITTED BY CHECK OR MONEY ORDER PAYABLE TO "TREASURER, STATE OF MAINE"

SEE ATTACHED FEE SCHEDULE

19. REQUIRED ATTACHMENTS: *(PLEASE CHECK OFF)*
- A. ☑ Certificate of Insurance with DEP as certificate holder
- B. ☐ Disclosure Statement listing all civil or criminal violations, court proceedings or consent agreements concerning handling of waste. **IF NONE, CHECK HERE** ☑
- C. ☑ Photocopy of vehicle registration (if applicable)
- D. ☑ Manifest Reporting Current OK LM

By signing this application, I certify that the information contained in and attached to this form is true, correct, and complete to the best of my knowledge.

William Kitchen — Name (printed or typed)

Pres — Title

DEP NHWTLP

William Kitchen — Signature

8/25/03 — Date Signed

Mail application with fees and attachments to:

NONHAZARDOUS WASTE TRANSPORTER LICENSE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333
(207) 287-2651

DEP NHWTLP

4-5-04 LM Processed

9-25-03 Processed DBM

THIS LICENSE IS NOT VALID UNLESS STAMPED WITH DEPARTMENT SEAL AND DATE.
Authority for issuing: 38 M.R.S.A. Sections 1304 (1) and 1304 (1-A).

20. BIENNIAL LICENSE EXPIRATION DATE: 10/20/05 LM (FOR DEPARTMENT USE ONLY)

Department of
the Secretary of State

Bureau of Motor Vehicles

Dan A. Gwadosky
Secretary of State

M F Chip Gavin
Deputy Secretary of State

Catherine Curtis
Director of Vehicle Services

Garry R. Hinkley
Chief of Motor Carrier Services

EFFECTIVE DATE: 09/01/2004
EXPIRATION DATE: 08/31/2005

MAINE IRP
INTERNATIONAL REGISTRATION PLAN

REGISTRANT INFORMATION

ACCT/FLEET/SUPP: 10882-05-000
USDOT: 0527207
LEGAL NAME: K B CORPORATION
DBA NAME: K B CORPORATION

K B CORPORATION
PO BOX 197
HAMPDEN ME 04444-0000

VEHICLE INFORMATION

EQUIP #: 76
MAKE: INTL
YEAR: 2001
USAGE: Truck Tractor
FUEL: Diesel

VIN: 2HSCHAPR11C001708
PLATE: 913768
YEAR DECAL: 0280844
MONTH DECAL:

STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT	STATE	WEIGHT
CT	080000	MA	099000	ME	100000	NB	045359	NH	080000
NJ	080000	NY	080000	PA	080000	QC	000006	RI	080000
VT	080000								

VALID ONLY WITH OFFICAL STATE SEAL
ORIGINAL MUST BE CARRIED IN VEHICLE
COPIES MAY BE MADE FOR OFFICE USE ONLY

29 State House Station; 101 Hospital Street; Augusta, ME 04333-0029
(207) 624-9000 x52135
(TDD) (207) 624-9105

(2)

5-17-05 No turn signal
5-5-03 No stop lights
2-9-05 Rule violation
6-17-05 Broken spring
6-15-05 Overweight on 395 – not in excess of the 100,000 Registration.

COMPLIANCE REVIEW	KB CORPORATION USDOT: 0527297	DATE: 09/19/2000 PAGE: 2

PART B

	RATING FACTORS	# OF POINTS	
		ACUTE	CRITICAL
Your proposed safety rating is	Factor 1: S	0	0
	Factor 2: S	0	0
SATISFACTORY	Factor 3: S	0	0
	Factor 4: S	0	0
	Factor 5: N	0	0
	Factor 6: S	-	-

Corrective actions must be taken for any violations (deficiencies) identified on Part B of this report.

RECEIVED BY:	TITLE:

HAZARDOUS WASTE/WASTE OIL TRANSPORTER PERMITS HELD BY ENPRO SERVICES, INC.

USDOT safety rating – SEA Score 66.72

Notice of violations (past 3 years)

- 9/5/03 crossover violation CMV
- 3/3/04 failure to display use decal
- 3/11/04 log book not current
- 5/3/04 violation of hazardous material regulation placard
- 5/3/04 violation of hazmat no emergency response information
- 5/3/04 air leak in brake chamber

STATE	PERMIT#	YEARS PERMITTED	EXPIRATION
Massachusetts	261	1983 to present	12/31/06
Maine	248	1985 to present	03/30/06
New Hampshire	TNH-108	1985 to present	06/30/06
Rhode Island	RI-507	1988 to present	06/30/05
Connecticut	CT-HW-529	1989 to present	06/30/05
Vermont	14604 & 14605	1992 to present	06/30/05
New York	MA-119	1999 to present	11/17/05
Pennsylvania	PA-AH0696	2002 to present	10/31/06
Alliance for Uniform HAZMAT Transportation (MI, OH, WVA., OK, MN, NV)	UPW-0315266-OH	2002 to present	01/01/06

DOT # 315266

DOT RSPA # 051603550006LN Expires 6/30/06

F:\1 Projects\Brunswick\workplan attach\ENPRO Transport Info.doc

HAZARDOUS WASTE/WASTE OIL TRANSPORTER PERMITS HELD BY ENPRO SERVICES, INC.

USDOT safety rating – SEA Score 66.72

Notice of violations (past 3 years)

- 9/5/03 crossover violation CMV
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Alliance for Uniform HAZMAT Transportation (MI, OH, WVA., OK, MN, NV)	UPW-0315266-OH	2002 to present	01/01/06

DOT # 315266

DOT RSPA # 051603550006LN Expires 6/30/06

cprc
COMMERCIAL PAVING & RECYCLING COMPANY

Old-Fashioned Quality
Journeys Into The Future

2 Gibson Road, Scarborough, ME 04074
Ph: 207-883-3325 · Fax: 207-883-1121
info@cpcrs.com · www.cpcrs.com

April 18, 2005

Commercial Paving & Recycling is listed with the Maine State DEP as a recycling facility for:

- Petroleum Containing Soil (Gas and Oil)
- Recyclers of Gypsum, Asphalt, Aggregate, Glass and Shingles
- Full Line Paving Operation

CPRC is located at:
2 Gibson Rd
Scarborough, Me 04074

Contact:
Reg Saunders Safety & Compliance Office:207-883-3325 Cell: 207-232-6242

Hours of Operation:
Winter:7-4:00 pm Summer: 6:30-4:30

State Contact:
Randy McMullan, MEDEP

NOV issued against CPRC for an end user not following our Recommended Use Guidelines in proper placement of our soils.

Last date of Reclaim inspection in January

Analytical requirements may be found on our web-site under: www.cpcrs.com

State of Maine

Department of Agriculture, Food and Rural Resources
Division of Quality Assurance & Regulations
28 State House Station, Augusta, ME 04333-0028
(207) 287-3841

SERIAL NUMBER

18411

2-17675	January 14, 2005	December 31, 2005
ID	DATE OF ISSUE	DATE OF EXPIRATION

This certifies that

Toman, Joshua J

2 Gibson RD
Scarborough, ME 04074

Public Weighmaster

Employer: **Commercial Paving & Recycling**
2 Gibson RD Scarborough, ME 04074

This certificate is valid only between the date issued and expiration date appearing herein and only the named holder for which issued may use it.

The person named herein is authorized to repair or sell weighing or measuring devices pursuant to 10 M.R.S.A., Chapter 801 as permitted by law for the listed authorizations.

This certificate and/or each type of authorization represented is subject to suspension, revocation or cancellation as authorized by Maine Revised Statutes.

DESCRIPTION OF LICENSE AUTHORIZATIONS	FEE
	25.00
TOTAL:	25.00

Department of Agriculture

Robert A. Spear

Commissioner

Division of Quality Assurance

David E. Dagnon

Director

State of Maine
Department of Agriculture, Food & Rural Resources
Division of Quality Assurance & Regulations

Public Weighmaster

Name:	Toman, Joshua J
ID:	2-17675
Exp Date:	December 31, 2005

Authoriz.:

State of Maine

Department of Agriculture, Food and Rural Resources
Division of Quality Assurance & Regulations
28 State House Station, Augusta, ME 04333-0028
(207) 287-3841

SERIAL NUMBER
18410

2-17658
ID

January 14, 2005
DATE OF ISSUE

December 31, 2005
DATE OF EXPIRATION

This certificate is valid only between the date issued and expiration date appearing herein and only the named holder to which issued may use it.

This certifies that
McFarland, Kenneth S
2 Gibson RD
Scarborough, ME 04074

Public Weighmaster

The person named herein is authorized to repair or sell weighing or measuring devices pursuant to 10 M.R.S.A. c. 501 as permitted by law for the following authorizations.

This certificate and/or each type authorization represented is subject to suspension, revocation or cancellation as authorized by Maine Revised Statutes.

Employer: Commercial Paving & Recycling
2 Gibson RD Scarborough, ME 04074

DESCRIPTION OF LICENSE AUTHORIZATIONS	FEE
	25.00
TOTAL:	25.00

Department of Agriculture
Robert A. Spear
Commissioner

Division of Quality Assurance
David E. Dagnon
Director

State of Maine
Department of Agriculture, Food & Rural Resources
Division of Quality Assurance & Regulations
Public Weighmaster

Name:	Kenneth S McFarland
ID:	2-17658
Exp Date:	December 31, 2005

Authoriz.:

State of Maine

Department of Agriculture, Food and Rural Resources
Division of Quality Assurance & Regulations
28 State House Station, Augusta, ME 04333-0028
(207) 287-3841

SERIAL NUMBER

18412

2-17657	January 14, 2005	December 31, 2005
ID	DATE OF ISSUE	DATE OF EXPIRATION

This certifies that

Trask, Michael A

2 Gibson RD
Scarborough, ME 04074

Public Weighmaster

Employer: **Commercial Paving & Recycling**
2 Gibson RD Scarborough, ME 04074

This certificate is valid only between the date issued and expiration date appearing herein and only the named holder for which issued may use it.

The person named herein is authorized to repair or sell weighing or measuring devices pursuant to 10 M.R.S.A., Chapter 501 as permitted by law for the listed authorizations.

This certificate and/or each type of authorization represented is subject to suspension, revocation or cancellation as authorized by Maine Revised Statutes.

DESCRIPTION OF LICENSE AUTHORIZATIONS	FEE
	25.00
TOTAL:	**25.00**

Department of Agriculture

Robert A. Spear

Commissioner

Division of Quality Assurance

David E. Dagnon

Director

State of Maine
Department of Agriculture, Food & Rural Resources
Division of Quality Assurance & Regulations

Public Weighmaster

Name:	Michael A Trask
ID:	2-17657
Exp Date:	December 31, 2005

Authoriz.:

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

COMMERCIAL RECYCLING SYSTEMS SCARBOROUGH, CUMBERLAND COUNTY MAINE PROCESSING FACILITY #S-021243-WK-A-N (APPROVAL WITH CONDITIONS)	)))))	SOLID WASTE ORDER NEW LICENSE

Pursuant to the provisions of 38 M.R.S.A. Section 1301 et seq., and 06-096 CMR 400 and 409, the Solid Waste Management Regulations (May 24, 1989), the Department of Environmental Protection has considered the application of COMMERCIAL RECYCLING SYSTEMS, with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. APPLICATION SUMMARY

A. Application: The applicant has applied for a license for the processing of special waste at its asphalt batching plant located on the Gibson road in Scarborough, Maine.

B. History: The Commercial Paving Co., Inc. received approval on August 24, 1992 (DEP # S-20826-WK-A-P) to process and blend virgin petroleum contaminated soils obtained from a Department supervised oil spill into their asphalt batching process. Commercial Recycling Systems is a division of the Commercial Paving Co., Inc.

C. Summary of Proposal: The applicant proposes to process and blend wastes into their asphalt batching process not currently covered under their existing license. This will include sand blast grit, petroleum contaminated residues and soils, bottom ash, asphalt roofing materials, catch basin grit, pre-shredded rubber, glass, and porcelain.

2. PROJECT DESCRIPTION

COMMERCIAL RECYCLING SYSTEMS	2	SOLID WASTE ORDER
SCARBOROUGH, CUMBERLAND COUNTY MAINE	)	
PROCESSING FACILITY	)	
#S-021243-WK-A-N	)	
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

3. PROVISIONS FOR STORAGE

All petroleum contaminated wastes will be stored on the concrete slab and other special wastes including sand blast grit and bottom ash will be stored within the special waste storage building. The special waste storage building is a 55 foot by 135 foot structure which overlies the lined concrete slab.

Storage of processed and unprocessed asphalt shingles , catch basin grit, pre-shredded rubber, and porcelain will take place within the bounds of the outdoor stockpile areas.

The applicant has not provided information on the proper siting of any pre-shredded rubber piles. The Department finds that the stockpiles for pre-shredded rubber shall not exceed 5000 square feet ground coverage. The waste rubber shall have a minimum mineral strip of 50 feet in width around the perimeter of the pile(s).

Depending on the type of asphalt product desired, the wastes will be introduced directly into the asphalt hot or cold mix process. For surface or binder mixes, the wastes will be used as an aggregate for asphalt cement products. The waste may also be utilized in the cold mix stabilization unit (pug mill) for use in road or shoulder base, or maintenance products.

The special waste is transported by a front end loader from the special waste storage building directly to the conveyor for the above referenced asphalt processes. No interim storage areas or additional processing is proposed. A 43 foot by 70 foot steel reinforced concrete slab has been installed for the containment of the petroleum contaminated soils and residues. The slab overlies 6 inches of well graded sand. A 30 mil high density polyethylene Gundle liner has been installed between the slab and the compacted sand. The concrete slab is sloped inward and has a total volume capacity of 4800 gallons. The surface of the slab has been treated with two coats of "Shed OX" water repellent sealant. In compliance with manufacturer's suggestions, the applicant will be cleaning and sealing the surface of the slab every 5 years.

Any leachate collected in the concrete slab from the special wastes will be pumped into the 6,000 gallon water storage trailer for introduction into the asphalt process.

4. TITLE, RIGHT OR INTEREST

SCARBOROUGH, CUMBERLAND COUNTY MAINE)
PROCESSING FACILITY)
#S-021243-WK-A-N)
(APPROVAL WITH CONDITIONS)) NEW LICENSE

5. FINANCIAL CAPACITY

The applicant has estimated the cost of the construction of the special waste storage building, maintenance of existing equipment, and the surface water monitoring program to be $98,000. Yearly operational costs are estimated to be $37,000. A letter from Key Bank states the applicant is financially capable of handling this amount.

6. TECHNICAL ABILITY

The applicant has been operating a cold and hot mix asphalt plants which are licensed to accept virgin petroleum contaminated soils. Review of Department records does not indicate any compliance problems with that license. The applicant has submitted information verifying that personnel has sufficient training to properly operate the facility.

7. TRAFFIC

The facility is accessed off the Gibson road in Scarborough. It is a paved, two lane road with 32 feet of travel surface excluding shoulders. The Town of Scarborough is responsible for the maintenance of the road. Vehicle traffic will utilize Route 1, taking either Pleasant Hill road or Wallace Avenue to the Gibson road.

The Pleasant Hill road/Gibson road and Wallace Avenue/Route 1 are the first major intersections on route to the facility. Sight distances and turning radii are adequate.

The maximum size and weight of vehicles using the facility will be 8 feet by 55 feet and 90,000 lbs. There are no special weight restrictions on the Gibson road or the Pleasant Hill road.

No adverse impacts are anticipated for the movement of traffic on and off site.

8. BUFFERS

There are no residences within 1000 feet of the proposed facility. The applicant has proposed to reduce the setback between the handling area and adjacent properties to 25 feet. The applicant has requested a variance as specified in finding 10 below.

9. ADDITIONAL SITE INFORMATION

A. The facility is not located in, on or over a protected natural resource.

COMMERCIAL RECYCLING SYSTEMS	4	SOLID WASTE ORDER
SCARBOROUGH, CUMBERLAND COUNTY MAINE	)	
PROCESSING FACILITY	)	
#S-021243-WK-A-N	)	
(APPROVAL WITH CONDITIONS)	)	NEW LICENSE

B. The facility is not located on a mapped sand & gravel aquifer nor is it located on a mapped 100 year floodplain.

C. A geotechnical report for the construction of the special waste storage building was supplied with the application. Subsoils are fill underlain by sands and/or silty clay. The fill is a gravely sand with occasional cobbles. The underlying sands and clays are part of the glaciomarine Presumpscot Formation. The fill extends to a maximum depth of 4 feet with the sands extending to 8 feet. Ground water was encountered at depths of 4 to 4.5 feet.

10. VARIANCES

The applicant has requested a variance from the requirements of 06-096 CMR 409.4(B)(2) which states: "There shall be a minimum of a minimum 100-foot buffer strip between the handling site and all public roads and other property boundaries.". In support of the variance request the applicant has submitted letters from all affected abutters granting permission to the applicant for reducing the 100 foot buffer to 25 feet. The Department finds the applicant has submitted clear and convincing evidence demonstrating that the intent of the Maine Solid Waste Management Regulations have been met.

11. STORM WATER RUNOFF

The applicant has submitted a 25 year 24 hour event stormwater report. The data was calculated utilizing the SCS TR-20 methodology.

The entire site is paved. A detention basin has been installed southerly of the handling area for accepting sheet flow of stormwater runoff. Drainage ditches encompass the perimeter of the facility eventually crossing the Pleasant Hill road. The stormwater eventually discharges to the Nonesuch River.

No unreasonable impacts are anticipated from stormwater runoff.

12. SURFACE WATER QUALITY

The applicant has submitted a surface water monitoring program with the application. All surface water samples will be collected within two hours of a storm event that exceeds 0.25 inches of rainfall. Surface water samples will be collected and analyzed at the following locations:

SCARBOROUGH, CUMBERLAND COUNTY MAINE)
PROCESSING FACILITY)
#S-021243-WK-A-N)
(APPROVAL WITH CONDITIONS)) NEW LICENSE

SOLID WASTE ORDER

A. At the northeast corner of the property identified as SWSS-1 on the Storm Water Control Site Plan (SWCSP).

B. At the entrance of a 36 inch culvert transporting storm water beneath Pleasant Hill road identified as SWSS-2 on the SWCSP.

C. At the entrance of a 24 inch culvert transporting storm water beneath Pleasant Hill road identified as SWSS-3 on the SWCSP.

Parameters analyzed will include total suspended solids, total phosphorous, pH, total petroleum hydrocarbons, specific conductivity, temperature, and total lead.

13. EROSION AND SEDIMENTATION CONTROL

The facility is paved and has a slope of less than 1%. No additional earth-moving activities are planned for the facility. To control potential sedimentation from day to day use of the facility, the applicant maintains wet sweeping on an as-needed basis. The sweepings are introduced into the asphalt process. In response to concerns regarding sedimentation and petroleum contamination to the detention basin, the applicant installed a sedimentation basin upgradient.

Design specifications recommend the sedimentation basin have a maximum separation of 1 foot between the bottom of the sedimentation basin and the bottom of the outlet culvert. The applicant will take monthly readings and dredge the basin as needed to maintain this separation. An excavator will be used to dredge excess sediments from the basin. During this process the drainage outlet of the sedimentation basin will be blocked.

The applicant has indicated the dredge spoils from the basin will be stored in the crushed aggregate stockpile. No provisions for testing the spoils has been proposed. The Department finds that all dredge spoils from the sedimentation basin shall be stored on the concrete slab within the special waste storage building unless analytical data is presented to clearly demonstrate the spoils are inert.

14. OPERATIONS MANUAL

The applicant has developed an Operations Manual for the facility so that daily operations meet the requirements of Maine's current Solid Waste Management Regulations. This includes a hazardous and special waste exclusion plan and a safety plan.

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SOLID WASTE ORDER

15. SCENIC CHARACTER

No physical changes are proposed to the site. Plantings of white pines have occurred along the Pleasant Hill road to screen the facility. No unreasonable impacts are anticipated for scenic character.

16. NOISE

A noise study was conducted in 1992 for the facility. Results from the study show a maximum reading of 74 decibels at the property boundaries on the C scale, which responds to frequencies ranging from 32 to 10,000 Hz. This scale indicates overall sound level including background. The applicant has stated this is in compliance with Scarborough's noise ordinance. No unreasonable impacts are anticipated from noise.

17. ODORS

The only material emitting odor will be the petroleum process residue which will be stored within the special waste storage building. No unreasonable impacts from odors are anticipated.

18. CONTRACTS FOR DISPOSAL

The applicant anticipates small amounts of waste such as metal, plastic sheets, and woodwaste will be by-passed during the asphalt process.

A. Scrap metal will be disposed at the Harcon Iron and Steel Company in Portland, Maine.

B. Wood waste will be disposed at Fuel Technology Incorporated in Lewiston, Maine.

C. Rubbish generated at the facility will be hauled to the Regional Waste System incinerator in Portland, Maine.

19. SAMPLING AND ANALYTICAL PLAN

Waste characterization shall be conducted for each waste source by the proposed generator. The applicant has developed a sampling plan which outlines the procedures for obtaining a representative sample. The plan is given to any proposed generator for the waste sampling. The pre-qualification form signed by the generator does not certify the sampling as being representative of the source. Department finds that in order to ensure

SCARBOROUGH, CUMBERLAND COUNTY MAINE)
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that the sample obtained for analysis is representative, the pre-qualification form signed by the generator shall certify that the sample is representative, and has been obtained in accordance with the requirements of SW-846, or an equivalent method. Furthermore, CRS shall certify that, based on process knowledge, historical analyses of the waste stream, and a review of all available and applicable information from the generator, the information contained in the generator's certification is accurate.

The applicant in its sampling and analytical plan has not provided details for assuring the accuracy of the analytical results. Therefore, the Department finds where the analysis of a material indicates any hazardous constituent to be within 50% of the regulatory limit for that constituent, the generator shall conduct a statistical analysis to determine if the waste is acceptable for processing or reuse at the solid waste facility. Statistical analyses shall be conducted in accordance with the requirements of EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, Volume II, Chapter 9 or an equivalent method approved by the Department. For all wastes characterized under this section, the allowable limits for the testing shall be those specified for the waste to be classified as a non-hazardous waste.

Waste may be accepted if the results of this testing are:

- PCB's less than 50mg/kg (dry weight limit)
- TCLP less than Regulatory Limit
- Corrosivity pH between 2.0 and 12.5
- Flashpoint greater than 140 degrees F
- Sulfide Reactivity less than 500 mg/kg
- Cyanide Reactivity less than 250 mg/kg

The applicant has provided information regarding the need for testing of volatiles and semivolatiles organic compounds where the Total Organic Halogens (TOX) exceed 1000 ppm. When TOX is greater than 1000 ppm, further analysis will be performed for the following parameters (chlorinated hydrocarbons which are listed hazardous wastes) utilizing Methods in EPA SW-846:

- Tetrachloroethylene
- Methylene chloride
- Trichloroethylene
- 1,1,1-Trichloroethane
- Chlorobenzene
- 1,1,2-Tricolor-1,2,2-trifluoroethane
- Ortho-Dichlorobenzene
- Trichlorofluoroethane
- 1,1,2-Trichloroethane

- Carbon tetrachloride
- Chlorinated fluorocarbons

If any of the chlorinated hydrocarbons are present in the waste, the presumption is that a listed hazardous waste was mixed with the waste oil, and that therefore the entire batch is unacceptable for processing due to the mixing of a listed hazardous waste with waste oil. Documentation to rebut this presumption may be submitted to the Department for review and approval.

Section 3 of the Operations Manual addresses the processing, handling, and storage of special waste. This will include a sampling and analytical plan, prequalification procedures, and handling & exclusion procedures.

- **Pre-qualification Form**

  The generator of the waste will verify the physical composition of the waste and certify that the waste is not hazardous. The waste can not contain significant quantities of metal, wood, or other debris, and it will not contain free liquid. CRS will submit to the Department a copy of the prequalification form and supporting analytical data within 48 hours of receipt by the facility.

  Petroleum containing soils (PCS) includes virgin non-gasoline from the clean-up of a Department supervised spill clean-up, virgin gasoline released from an underground storage tank, virgin gasoline released from other sources, non-virgin petroleum released from underground storage tanks, and non-virgin petroleum from other sources.

  Petroleum containing process residue will be accepted at the facility. One identified source will be Clean Harbors Environmental Services, Inc. in South Portland, Maine.

  Bottom ash will be accepted by the facility. No generator has been identified for the waste stream.

  Spent sand blast grit will be accepted at the facility. One proposed source will be Portsmouth Naval Shipyard.

- **Sampling**

  All process materials with the exception of soil containing virgin petroleum oil from the clean-up of a Department supervised spill clean-up, glass, rubber, asphalt roofing materials, and porcelain will require sampling and analysis.

SCARBOROUGH, CUMBERLAND COUNTY MAINE) SOLID WASTE ORDER
PROCESSING FACILITY)
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- **Analysis**

The following analyses will be conducted:

Soil containing virgin non-gasoline as part of a Department supervised spill clean-up will require a Department manifest letter. Soil containing virgin non-gasoline which is not part of a Department supervised clean-up will require a TCLP for metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver). The continuing sampling frequency will be every 500 tons or one sample per source, whichever is more frequent.

Soil containing virgin gasoline released from an underground storage facility will be tested for TCLP Lead. The continuing sampling frequency will be every 500 tons or one sample per source, whichever is more frequent.

Soil containing virgin gasoline released from non-underground storage facilities sources will be tested for TCLP Lead and Benzene. The continuing sampling frequency will be every 500 tons or one sample per source, whichever is more frequent.

Soil containing non-virgin petroleum released from underground storage facilities will be tested for Total Organic Halogens, Flashpoint, PCB's, TCLP metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver), pH as Corrosivity, and Reactivity (sulfide and cyanide). Soil containing non-virgin petroleum released from non-underground storage sources will also be tested for semi-volatile organic compounds as well as Total Organic Halogens, Flashpoint, PCB's, TCLP metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver), pH as Corrosivity, and Reactivity (sulfur and cyanide). The continuing sampling frequency will be every 250 tons or one sample per source, whichever is more frequent.

Petroleum containing process residue from Clean Harbors of New England will require TCLP for metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver). All other sources containing petroleum process residue will be tested for Total Organic Halogens, semi-volatile organic compounds, Flashpoint, PCB's, TCLP metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver), Corrosivity as pH, and Reactivity (sulfur and cyanide). The continuing sampling frequency will be every 45 tons or one per roll-off container.

The applicant has not provided information on the analytical testing requirements or monitoring frequency for bottom ash. The Department finds the bottom ash will be tested for TCLP metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Vanadium). The continuing sampling frequency will be one sample

per 200 tons for the first 1000 tons, and then one sample per 1000 tons or one sample annually, whichever is more frequent. If the TCLP level of Vanadium is greater than 200 ppm, the waste is unacceptable at the facility unless a Department-approved high-vanadium ash handling and air monitoring programs are implemented at the time of processing.

Spent sand blast grit from Portsmouth Naval Shipyard will be tested for TCLP Lead. All other sources will be tested for TCLP Lead, Flashpoint, pH as Corrosivity, and Reactivity (sulfur and cyanide). The continuing sampling frequency will be every 500 tons or one sample per source, whichever is more frequent.

20. ANNUAL REPORTS

The applicant has proposed to submit analytical results from the surface water monitoring program within 30 days of receipt. The applicant has not proposed any additional reporting of the facility's operations. The Department finds that records shall be maintained regarding the waste monitoring results of the facility during the previous year. Waste monitoring records shall include all analyses of the incoming waste including Quality Control and Quality Assurance and statistical inference data, pre-qualification forms and supporting analytical data, and the continuing sampling and analysis data. Upon request, all such records shall be made available for the Department to review.

In addition, one year from the date of this license and every year thereafter, the owner or operator of the facility shall submit to the Department an annual report pertaining to the operation of the facility. It shall include information summarizing the origin of the waste, quantities accepted, identity of the transporter, the date of acceptance, the date of processing, and problems encountered and methods of solution.

BASED on the above findings of fact, the Department makes the following conclusions:

A. The applicant has provided adequate evidence of financial capacity and technical ability to meet air and water pollution control standards.

B. The applicant has made adequate provision for traffic movement of all types into, out of, or within the development area.

C. The applicant has made adequate provision for fitting the facility harmoniously into the natural environment, and the development will not adversely affect existing uses or scenic character, air quality or other natural resources in the Town of Scarborough or in neighboring municipalities provided the handling area for solid waste is no closer than 25 feet to any property boundary.

COMMERCIAL RECYCLING SYSTEMS SCARBOROUGH, CUMBERLAND COUNTY MAINE PROCESSING FACILITY #S-021243-WK-A-N (APPROVAL WITH CONDITIONS)	)))))	SOLID WASTE ORDER NEW LICENSE

D. The proposed facility will be built on soil types which are suitable to the nature of the undertaking, and will not cause unreasonable erosion of soils.

E. The applicant has made adequate provisions for the control of odors and noise.

G. The facility will not pollute any water of the State, contaminate the ambient air, constitute a hazard to health or welfare or create a nuisance provided:

a. The dredge spoils from the sedimentation basin are stored on the concrete slab within the special waste storage building.
b. The sampling and analytical plan as described in finding 19 is followed.
c. Waste management records for the previous operational year are maintained and retained, and an annual report is submitted to the Department as specified in finding 20.
d. Each pile of shredded rubber is located within a cell covering no more than 5000 square feet and is surrounded by a 50 foot wide mineral strip.

THEREFORE, the Department APPROVES the above noted application of COMMERCIAL RECYCLING SYSTEMS to construct and operate a Solid Waste Recycling Facility in Scarborough, Maine, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. The Standard Condition of Approval, a copy attached as Appendix A.

2. The stockpiles for pre-shredded rubber shall not exceed 5000 square feet ground coverage and shall have a minimum mineral strip of 50 feet in width around the perimeter of the pile.

3. All dredge spoils from the sedimentation basin once dewatered shall be stored on the concrete slab within the special waste storage building.

4. The Sampling and Analytical Plan shall be implemented as described in finding 19.

5. One year from the date of this license and every year thereafter, the owner or operator of the facility shall submit to the Department an annual report pertaining to the operation of the facility. It shall include information summarizing the origin of the waste, quantities accepted, identity of the transporter, the date of acceptance, the date of processing, and problems encountered and methods of solution.

6. Records shall be maintained regarding the waste monitoring of the facility during the previous year. Records shall include all analyses of the incoming waste including quality control and quality assurance and statistical inference data, pre-qualification forms and

SCARBOROUGH, CUMBERLAND COUNTY MAINE)
PROCESSING FACILITY)
#S-021243-WK-A-N)
(APPROVAL WITH CONDITIONS)) NEW LICENSE

supporting analytical data, and the continuing sampling and analysis data. Upon request, all such records shall be made available for the Department to review.

7. The handling area for the solid waste shall be no closer than 25 feet to any property boundary.

DONE AND DATED AT AUGUSTA, MAINE THIS 30 DAY

OF June, 1994.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Debra H. Garrett for
Debra J. Richard, Acting Commissioner

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURE.

Date of initial receipt of application: January 25, 1993

Date of application acceptance: February 16, 1993

Date filed with the Board of Environmental Protection

FILED
JUL 5 1994
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

This order was prepared by William Butler, Bureau of Hazardous Materials and Solid Waste Control

OWBDO212/wb/llg

GENERATOR PRE-QUALIFICATION FORM

I TYPE OF WASTE: **BOTTOM ASH & PETROLEUM CONTAINING SOIL (Non Virgin Surface Sources)**

II AMOUNT OF WASTE: +/-_____ **Cu Yds** +/-_____ **Tons**

III GENERATOR INFORMATION:

a) Generator _____ **Contact** _____
Address _____ **Phone#** _____
b) Process Generating the Waste _____
c) Site of Generation _____
d) Contracting Firm _____ **Contact** _____
Address _____ **Phone#** _____

IV WASTE CHARACTERIZATION: **Analytical Method** - See Table 1

PARAMETER	ANALYTICAL RESULTS	ACCEPTANCE CRITERIA
a) TOX[1]	_____ ppm	<100 ppm
b) Semi-VOCs	(See Attachment A)	
c) PCBs	_____ ppm	<EQL[2]
d) TCLP - 8 RCRA Metals	(See Attachment A)	
e) Flash Point	_____ °F, °C	>140°F or >60°C
f) pH as Corrosivity	_____ s.u.	2.0> pH <12.5 s.u.
g) Reactivity-Cyanide	_____ ppm	<250ppm
h) Reactivity-Sulfide	_____ ppm	<500ppm
i) % Solids	_____ %	no free liquids
j) TCLP Vanadium	_____ ppm	< 200 ppm

V GENERATOR CERTIFICATION:

The undersigned agrees that to the best of his/her knowledge the materials, as represented and described above, to be processed by Commercial Recycling Systems do not contain any hazardous waste as those terms are used in the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Hazardous Materials Transportation Act, the Toxic Substances Control Act, the Clean Air Act and the Clean Water Act, or any similar state or local law, or any regulation promulgated pursuant thereto, or any other applicable law, except those materials expressly indicated above. Samples obtained by generator for pre-qualification of this material have been obtained in accordance with the requirements of Table 1 and CRS's Sampling and Analytical Plan.

_____ _____
(Name Print/Type) (Title)

_____ _____
(Signature) (Date)

VI COMMERCIAL RECYCLING SYSTEMS ACCEPTANCE:

CRS accepts this waste in accordance with requirements set forth in its MDEP Solid Waste Facility Processing License #S-021243-WK-A-N.

_____ _____
(Name Print/Type) (Title)

_____ _____
(Signature) (Date)

[1] If TOX is greater than 100 ppm, see Attachment A for additional parameters.
[2] Laboratory "Estimated Quantitation Limit" per EPA SW846 volume 1A chapter 1

GENERATOR PRE-QUALIFICATION FORM

I TYPE OF WASTE: **BOTTOM ASH (& Bottom Ash Containing Soil)**

II AMOUNT OF WASTE: +/_____ **Cu Yds** +/_____ **Tons**

III GENERATOR INFORMATION:

a) Generator _____ **Contact** _____
Address _____ **Phone#** _____
b) Process Generating the Waste _____
c) Site of Generation _____
d) Contracting Firm _____ **Contact** _____
Address _____ **Phone#** _____

IV WASTE CHARACTERIZATION:

Analytical Method - See Table 1

PARAMETER	ANALYTICAL RESULTS TCLP	ACCEPTANCE CRITERIA TCLP
a) TCLP VANADIUM	_____ppm	<200 ppm
b) 8 RCRA METALS	(see attachment A)	

V GENERATOR CERTIFICATION:

The undersigned agrees that to the best of his/her knowledge the materials, as represented and described above, to be processed by Commercial Recycling Systems do not contain any hazardous waste as those terms are used in the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Hazardous Materials Transportation Act, the Toxic Substances Control Act, the Clean Air Act and the Clean Water Act, or any similar state or local law, or any regulation promulgated pursuant thereto, or any other applicable law, except those materials expressly indicated above. Samples obtained by generator for pre-qualification of this material have been obtained in accordance with the requirements of Table 1 and CRS's Sampling and Analytical Plan.

_____ _____
(Name Print/Type) (Title)

_____ _____
(Signature) (Date)

VI COMMERCIAL RECYCLING SYSTEMS ACCEPTANCE:

CRS accepts this waste in accordance with requirements set forth in its MDEP Solid Waste Facility Processing License #S-021243-WK-A-N.

_____ _____
(Name Print/Type) (Title)

_____ _____
(Signature) (Date)

ATTACHMENT A - GENERATOR PRE-QUALIFICATION FORM

ADDITIONAL WASTE CHARACTERIZATION PARAMETERS *
SAMPLE RESULTS & ACCEPTANCE LIMITS

WASTE CHARACTERIZATION:

CRS Required Halocarbons

When TOX either exceeds 100 ppm or is not being done, the laboratory needs to do the following: Analyze by USEPA Method 8260. Calibrate for and report the following compounds:

PARAMETER	SAMPLE RESULTS Result		ACCEPTANCE LIMITS Limit	
Tetrachloroethylene		mg/kg	<7	mg/kg
Methylene Chloride		mg/kg	<2	mg/kg
Trichloroethylene		mg/kg	<5	mg/kg
1,1,1-Trichloroethane		mg/kg	<2	mg/kg
Chlorobenzene		mg/kg	<1000	mg/kg
1,2-Dichlorobenzene		mg/kg	<2	mg/kg
1,1,2-Trichloroethane		mg/kg	<2	mg/kg
Carbon Tetrachloride		mg/kg	<5	mg/kg

If present, report the following as tentatively identified compounds with the concentration estimated from the nearest internal standard assuming a relative response factor of 1. Flag the result with a "J" qualifier:

1,1,2-Trichloro-1,2,2-Trifluoroethane		mg/kg	<2	mg/kg
Trichlorofluoroethane		mg/kg	<2	mg/kg
Chlorinated Fluorocarbons		mg/kg	<2	mg/kg

Semi-VOCs (from USEPA TCLP list)**

	Total mg/kg	TCLP mg/L	Total **		TCLP ***	
O-Cresol			<2000	mg/kg	<200	mg/L
M-Cresol			<2000	mg/kg	<200	mg/L
P-Cresol			<2000	mg/kg	<200	mg/L
Total Cresols			<2000	mg/kg	<200	mg/L
1,4-Dichlorobenzene			<75	mg/kg	<7.5	mg/L
2,4-Dinitrotoluene			<1.3	mg/kg	<0.13	mg/L
Hexachlorobenzene			<1.3	mg/kg	<0.13	mg/L
Hexachlorobutadiene			<5	mg/kg	<0.5	mg/L
Hexachloroethane			<30	mg/kg	<3	mg/L
Nitrobenzene			<20	mg/kg	<2	mg/L
Pentachlorophenol			<1000	mg/kg	<100	mg/L
Pyridine			<50	mg/kg	<5	mg/L
2,4,5-Trichlorophenol			<4000	mg/kg	<400	mg/L
2,4,6-Trichlorophenol			<20	mg/kg	<2	mg/L

8 RCRA Metals **

	Total mg/kg	TCLP mg/L	Total **		TCLP ***	
Arsenic			<50	mg/kg	<5.0	mg/L
Barium			<1000	mg/kg	<100	mg/L
Cadmium			<10	mg/kg	<1.0	mg/L
Chromium			<50	mg/kg	<5.0	mg/L
Lead			<50	mg/kg	<5.0	mg/L
Mercury			<2	mg/kg	<0.2	mg/L
Selenium			<10	mg/kg	<1.0	mg/L
Silver			<50	mg/kg	<5.0	mg/L

* Check Generator Pre-Qualification Form for parameters that apply & Table I for analytical methods and hold times.

** Testing for TCLP **or** Totals is acceptable. If analytical results for Totals exceed the acceptance limit, TCLP analysis is required for that compound.

*** If less than 6 composite samples are submitted, the TCLP acceptance criteria is lowered to 50% of listed limits.

Attachment B – Acceptable concentration for PAHs (polynuclear aromatic hydrocarbons)

(Based on Maine Solid Waste Regulations, Chapter 418, Beneficial Use of Solid Wastes, Appendix A

Compound	Acceptance limit mg/kg	Sample result
Acenaphtene	712 mg/kg	
Acenapthylene	n/a	
Benz[a]anthracene	11	
Benzo[b]fluoranthene	11.4	
Benzo[k]fluoranthene	110	
Benzo[a]pyrene	7.7	
Chrysene	1100	
Dibenz[ah]anthracene	1.1	
Fluoranthene	3875	
Fluorene	3875	
Indeno[1,2,3-cd]pyrene	11	
Naphthalene	105	
Phenanthrene	n/a	
Pyrene	2875	

TABLE III

(from *page-17, CRS Operations Manual--Rev. 2/21/01*)

NUMBER OF SAMPLES REQUIRED

Material Volume (tons)	Number of Composite Samples Required	Number of Subsamples Required per Composite Sample
VIRGIN PETROLEUM CONTAINING SOIL & BLASTING GRIT:		
1-100	1	3
101-200	1	6
201-300	1	9
301-400	1	12
401-500	1	15
501-1,000	2, plus 1 for every 500 tons above 1,000	15
PETROLEUM CONTAINING PROCESS RESIDUE:		
0-45	1 per roll-off container	3
BOTTOM ASH:		
1-250	1	6
251-500	2	6
501-750	3	6
751-1,000	4	6
1,001-2,000	4, plus 1 for every 1,000 tons above 1,000	24
NON VIRGIN PETROLEUM CONTAINING SOIL:		
1-100	1	3
101-200	1	6
201-250	1	8
251-500	2	8
501-750	3, plus 1 for every 250 ton above 750	8

CPB

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

RECEIVED
OCT 16 1991
Goodard & Curran Inc.

DEPARTMENT ORDER

IN THE MATTER OF

TOWN OF BRUNSWICK Brunswick, Cumberland County SOLID WASTE LANDFILL PHASES 2, 3, AND RENEWAL S-08458-7A-F-N	)	SOLID WASTE ORDER FINDING OF FACT AND ORDER

Pursuant to the provisions of Title 38 M.R.S.A., Sections 481 et. seq. and 1301 et. seq. and the Solid Waste Management Regulations (hereinafter referred to as "the regulations"), the Department of Environmental Protection has considered the application of the TOWN OF BRUNSWICK, with its supportive data, staff summary, agency review comments, public comments, public hearing transcript, and other related materials on file, and finds the following facts:

1. PROJECT DESCRIPTION

On March 23, 1983, the applicant received conditional Board approval to site Phases 1, 2 and 3 of a municipal landfill off the Graham Road in Brunswick and to construct and use only Phase 1 of the landfill. On August 10, 1983, the Board found that the applicant had complied with approval conditions related to the design, construction and groundwater monitoring of Phase 1, thereby authorizing the initiation of construction. Phase 1 of the Brunswick landfill became operational on January 9, 1984. The facility receives municipal solid waste from businesses and residents of Brunswick as well as from the Brunswick Naval Air Station.

Phase 1 covers 7.5 acres and is of secure design, having a leachate collection system underlaid by a 40 mil high density polyethylene (HDPE) synthetic flexible membrane liner (FML), geotextile and compacted native soil. Leachate is treated onsite in a system consisting of three lagoons before being discharged to the Androscoggin River. Phase 1 is expected to reach its design capacity of 335,000 cubic yards in June of 1992. The Interim Closure Plan for Phase 1 provides for the hydraulic isolation of the wastes in Phase 1 and the Phase 1 liner from both precipitation and leachate generated from wastes to be placed in Phases 2 and 3.

The applicant has requested a variance from the final cover requirements of Chapter 401.6(B)(8)(a)(iii) of the regulations as part of its Interim Closure Plan for Phase 1 and operating plan for Phases 2 and 3. The justification given for the variance request is that final cover for Phase 1 and the other phases should be in accordance with regulatory design requirements in effect at the time this entire facility is closed. The applicant has submitted a preliminary design for its Phase 1 Interim Closure Plan.

TOWN OF BRUNSWICK Brunswick, Cumberland County SOLID WASTE LANDFILL PHASES 2, 3, AND RENEWAL S-08458-7A-F-N	2))))	SOLID WASTE ORDER FINDING OF FACT AND ORDER

The Brunswick Municipal Landfill currently accepts approximately 40,000 cubic yards of municipal solid waste per year. The applicant's proposed operation of the landfill would provide approximately 18 years of additional disposal capacity for municipal solid waste generated in the Town of Brunswick.

The applicant proposes to begin construction of Phase 2 in October of 1991 and begin operations there in June of 1992. Phase 2 is located southerly of Phase 1, has a capacity of 191,375 cubic yards and is composed of two parts, A and B. Phase 2A is located entirely within the liner of Phase 2. Phase 2B is located between the high point of Phase 1 and the high point of Phase 2A as it would exist if Phase 2A were built to stand alone within the Phase 2 liner. Phase 2B is underlaid by Phase 2A (and the Phase 2 liner); a transitional liner between Phases 1 and 2; and the Phase 1 interim cap (which in turn is underlaid by Phase 1 waste and liner). The applicant plans to operate Phase 2 in a north to south manner with both parts being concurrently active during the life of Phase 2.

The applicant proposes to begin construction of Phase 3 in 1995 and begin operations there in 1996. Phase 3 is located westerly of Phase 1, has a capacity of 541,500 cubic yards and is composed of three parts - A, B and C. Phases 3A and 3B are located entirely within the liner of Phase 3, but are separated by a interim dike which serves to minimize the volume of leachate generated. Phase 3C is underlaid by Phases 3A and 3B (and the Phase 3 liner); transitional liners between Phase 3 and the liners of Phases 1 and 2; Phase 2B (and the Phase 2 liner); and the Phase 1 interim cap. The applicant plans to operate Phase 3 in an east to west manner with parts A and C being concurrently active during the initial stages of development and all three parts being concurrently active during later stages of development.

The areas covered by the Phase 2 and Phase 3 liners are 3.7 acres and 5.0 acres, respectively. The liner system proposed for Phases 2 and 3 is that specified by Chapter 401.4(C)(2)(b) of the regulations as the minimum design standards for secure landfills serving a population of more than 15,000 people. This liner system consists of (going from top to bottom) a leachate collection system embedded in 12 inches of sand, an 80 mil HDPE FML, a leachate detection system embedded in 12 inches of sand, an 80 mil HDPE FML and 36 inches of compacted clay. The applicant has submitted final design plans for Phase 2. The applicant has not submitted preliminary or final plans for Phase 3.

TOWN OF BRUNSWICK
Brunswick, Cumberland County
SOLID WASTE LANDFILL
PHASES 2, 3, AND RENEWAL
S-08458-7A-F-N

3 SOLID WASTE ORDER

FINDING OF FACT AND ORDER

Construction costs for the proposed expansion are estimated to be $3,076,762; $1,302,183 for Phase 2 and $1,774,579 for Phase 3. Construction costs for final closure of the facility are estimated to be $2,354,482 (all costs expressed in 1990 dollars). The town of Brunswick has submitted documentation that through utilization of revenues and bonding ability it has sufficient financial capacity to meet state air and water pollution standards and to construct, operate and maintain the proposed development of Phases 2 and 3.

2. WATER QUALITY

Groundwater monitoring data generated since Spring 1991 indicates that there may be a trend of deteriorating groundwater quality in the area east of the landfill. The groundwater monitoring program used to generate this data, although approved by the Department has not provided sufficient groundwater quality information regarding past leachate handling and storage practices or other possible leachate discharges.

ENVIRONMENTAL MONITORING PROGRAM

The applicant's proposed Environmental Monitoring Program, as amended, meets the requirements of Chapter 401.6(C) of the regulations as to determining whether landfilled wastes or the leachate collection and treatment system have contaminated or will contaminate groundwater or surface water outside the approved solid waste boundary.

4. OPERATIONS

The applicant has operated the facility for solid waste disposal and handling since 1984. The applicant has retained the services of Woodard & Curran Inc., Consulting Engineers of Portland, Maine to provide design, development and operations assistance. In addition, the applicant has involved the services of Robert G. Gerber, Inc. in Freeport, Maine to provide hydrogeological and geotechnical consultation in conjunction with the services of Woodard & Curran, Inc. in the design and development of the secure landfill. The landfill is managed and operated by the Town of Brunswick Public Works Department.

The applicant has not submitted an operating manual that ensures that the secure landfill is operated and maintained in a manner that meets the requirements of Chapter 401.6(B) of the regulations and protects the integrity of the engineered systems.

Operational deficiencies at the facilities in 1989 resulted in breakouts of leachate running over the edge of the liner and onto the ground. Corrective measures which were taken eliminated this problem and management of the facility has improved since then. A staff inspection of the facility on August 29, 1991 revealed that the applicant was in substantial compliance with all

TOWN OF BRUNSWICK
Brunswick, Cumberland County
SOLID WASTE LANDFILL
?HASES 2, 3, AND RENEWAL
S-08458-7A-F-N

4 SOLID WASTE ORDER

FINDING OF FACT AND ORDER

5. CRIMINAL OR CIVIL RECORD

The applicant has submitted a disclosure statement in accordance with Chapter 400.4(H) of the regulations. The applicant has had no adjuducated violations of environmental laws.

6. WASTE MINIMIZATION

The applicant has enacted a solid waste ordinance which includes a mandatory recycling program, operates a leaf and yard waste composting program and is considering implementation of a pay per bag system to facilitate source reduction.

7. PUBLIC HEARING

A public hearing was conducted by the Department of Environmental Protection at the Curtis Memorial Library in Brunswick on September 11, 1991 pursuant to the Administrative Procedures Act, Title 5, Chapter 375.

8. PUBLIC BENEFIT

The Maine Waste Management Agency has considered the application of the Town of Brunswick to develop Phases 2 and 3 of its landfill and concluded that:

A. The proposed development will meet capacity needs identified in the State Plan in addition to capacity that is under development by the Office of Siting and Disposal Operations under Title 38, M.R.S.A., Section 2156 or by other facilities approved by the Agency at the time of this application;

B. The proposed development will be consistent with the State Plan; and

C. The proposed development is consistent with local, regional or state collection, storage, transportation, processing or disposal.

BASED on the above findings of fact, the Department makes the following conclusions:

1. The proposed facility will not pollute any water of the State, will not contaminate the ambient air, constitute a hazard to health and welfare or create a nuisance provided that the applicant receive approval from the Department on final design plans for the construction of Phases 2 and 3 and the interim closure of Phase 1 and provided that the applicant receive approval from the Department on a revised operating manual.

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Brunswick, Cumberland County
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) SOLID WASTE ORDER
)
)
)
) FINDING OF FACT AND ORDER

2. The volume of waste and the risks related to its handling and disposal have been reduced to the maximum practical extent by recycling and source reduction.

THEREFORE, the Department APPROVES with attached conditions the application of the TOWN OF BRUNSWICK to construct and operate Phases 2 and 3, to renew its license to operate its landfill in Brunswick, Maine and to be granted a variance from the requirements of Chapter 401.6(b)(8)(a)(iii) of the regulations in accordance with the following conditions:

1. The Standard Conditions of Approval, a copy attached.

2. In addition to any specific erosion control requirements set forth in this Order, the applicant shall take all necessary measures to ensure that its activities or those of its agents do not result in noticeable erosion of soils on the site during the construction and operation of the project covered by this approval.

3. Prior to the construction of the Phase 2 or Phase 3 liners, the applicant shall obtain Departmental approval of a) final design plans, b) construction management procedures, and c) the qualifications of the synthetic liner installation contractor, the resident construction inspection engineer, and the independent quality assurance agents who will be employed for their respective work in development of the landfill liner system.

4. Prior to implementing any construction contract "change orders" and bid addenda the applicant shall notify the Department in a timely fashion such that adequate comment on the item can be performed. If no Department response to the applicant's notification occurs within five (5) working days, approval of the "change order" is automatically granted. This condition applies to all phases of construction for Phases 1, 2 and 3.

5. Prior to operation of Phase 2, the applicant shall obtain Departmental approval of a revised Operating Manual which meets the requirements of Chapter 401, Section 6 of the regulations.

6. Prior to the operation of Phases 2B or 3C, the applicant shall obtain Departmental approval of the Interim Closure Plan for Phase 1.

Tome

STATE OF MAINE
MAINE WASTE MANAGEMENT AGENCY
EXECUTIVE DEPARTMENT

JOHN R. McKERNAN, JR.
GOVERNOR

SHERRY F. HUBER
EXECUTIVE DIRECTOR

AGENCY ORDER
IN THE MATTER OF

N OF BRUNSWICK	)	**AGENCY REVIEW of PROPOSED**
nswick, Maine	)	**SOLID WASTE DISPOSAL FACILITY**
DFILL EXPANSION	)	
ject Number: DF-0006-SL-E	)	FINDINGS of FACT and ORDER

Pursuant to Title 38, M.R.S.A., section 2157, the Maine Waste Management Agency ("Agency") has considered the application of the Town of Brunswick with its supportive data and other related materials on file and finds the following facts:

1. PROJECT DESCRIPTION / PROCEDURAL HISTORY

On March 25, 1991 the Town of Brunswick filed an application for Agency approval to expand its existing landfill on Graham Road in Brunswick, Maine.

The proposed expansion will accept the municipal, commercial and industrial solid waste generated within the Town of Brunswick. Significant industrial users currently include Brunswick Naval Air Station, Bowdoin College, Bath Iron Works and Arrowhart Industries.

The existing 7.5 acre secure landfill was originally licensed by the Department of Environmental Protection in January 1983 and will reach its approved capacity by June 1992 according to the Town. The proposed expansion will increase the capacity by approximately 735,000 yards. This increase in capacity is expected to extend the life of the landfill until the year 2014 based on current waste generation rates in Brunswick, an assumed population growth rate of one percent per year and compliance with the State recycling goals.

2. AGENCY JURISDICTION / SCOPE of REVIEW

Maine law requires the Town of Brunswick to obtain Agency approval of the proposed landfill expansion prior to obtaining approval from the Board of Environmental Protection. Specifically, under 38 M.R.S.A., Section 2157 (as amended by PL 1989, c. 867), Brunswick must demonstrate to the Agency that the proposed expanded facility:

N OF BRUNSWICK
wick, Maine
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) SOLID WASTE DISPOSAL FACILITY
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A. Will meet capacity needs identified in the Maine Waste Management and Recycling Plan dated July 1990, (herein "State Plan") in addition to capacity that is under development by the Agency's Office of Siting and Disposal Operations ("Office") under Title 38, M.R.S.A., section 2156 or by any other party approved by the Office at the time of application;

B. Will be consistent with the State Plan; and

C. Is consistent with local, regional or state waste collection, storage, transportation, processing or disposal.

3. NEED FOR FACILITY

In the State Plan, the Agency has identified a need for expanding existing landfill disposal capacity in the Central Maine Region. The Brunswick landfill is identified in the Plan as a facility for which the feasibility of expansion should be explored.

The Agency's Office of Siting and Disposal Operations is not developing disposal capacity designed to meet this identified need; nor has the Agency approved the development of other facilities designed to meet this need.

4. CONSISTENCY WITH STATE PLAN

Under Chapter 410, Section 5(D)(2) of the Agency's regulations, the Agency must find that the proposed expansion is consistent with the State Plan when the Town demonstrates that all practical steps will be taken to minimize the volume of waste to be placed in the expansion.

The Town of Brunswick is taking the necessary steps to minimize the volume of solid waste disposed of in the proposed expansion area. At present, the Town recycles about 15% of its MSW or 2,980 tons of the total waste stream of 19,514 tons. The projected recycling plan calls for a 25% recycling rate by the year 1992 (approximately 5,913 tons) and a 50% recycling rate by 1994 (approximately 9,386 tons). (See attachment A). By increasing the current 15% recycling rate to 50%, the Town expects to extend the life of the proposed landfill expansion by eight years. (See attachment B).

To meet these goals, the Town is actively involved in waste reduction nd recycling programs. The Town received a recycling grant from the Maine Waste Management Agency that will assist in meeting the State's

WN OF BRUNSWICK	3	AGENCY REVIEW of PROPOSED
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waste reduction and recycling goals. The grant funds were used to expand its recycling program to include curbside collection of five categories of recyclables to all residents of the town. Previously, only one-half of the Town received this service and only one type of recyclable was collected. Curbside collection of recyclables is now available weekly to all residents.

Recycling in Brunswick is mandated by the Sanitation Ordinance. This ordinance specifies that residents, businesses and institutions within the Town of Brunswick are required to separate recyclable materials, defined as newsprint, corrugated cardboard, plastic, office paper and glass. To further encourage recycling the town offers an extensive education and assistance program, and in addition to its curbside collection service, it provides two conveniently located recycling drop-off centers. Brunswick also operates a recycling processing center which accepts recyclables at no tipping fee.

The MWMA grant provided funding to construct a compost pad and Brunswick operates a DEP licensed leaf and yard waste composting area. Residents and businesses can deliver leaves and yard waste to this facility at no cost. Finished compost is used by the Public Works Department for municipal projects and is offered to residents for their use.

Methods of expanding recycling, waste separation and waste reduction are currently being investigated. Programs being considered are: expanding the requirements and non-compliance fines of the Sanitation Ordinance, implementing a pay per bag system for the disposal of residential refuse, and implementing WasteCap, a waste reduction program for business and industry.

The Brunswick Town Council has endorsed a resolution to take all actions necessary to meet the State recycling goals of 25% by 1992 and 50% by 1994. The town anticipates that future expansion of their mandatory recycling, curbside collection, and composting (along with publicity encouraging home composting) programs will allow them to reach the State's goals.

5. <u>CONSISTENCY WITH WASTE COLLECTION, STORAGE, TRANSPORTATION, PROCESSING OR DISPOSAL</u>

Based on the findings set forth in paragraphs A, B and C below, the proposed landfill expansion is consistent with local, regional and state waste collection, storage, transportation, processing and

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AGENCY REVIEW of PROPOSED SOLID WASTE DISPOSAL FACILITY

FINDINGS of FACT and ORDER

disposal.

A. Meeting Regional Needs

The proposed expansion is intended to fill the solid waste disposal needs of the Town of Brunswick only.

B. Incineration

The Town of Brunswick has determined that incineration is not a viable solid waste disposal option. In comparing the proposed landfill expansion option to incineration, three problems with incineration have been pointed out by the town: high tipping fees, high transportation costs and limited year round capacity.

Since additional capacity is only available at the incinerators during winter months at this time, Brunswick contends that the cost of constructing a transfer center and the complexity of switching from one operation to the other make this choice expensive and impractical relative to the expansion of the Graham Road landfill.

C. Contingency Plan

Regional Waste Systems (RWS), Maine Energy Recovery Corp. (MERC) and Penobscot Energy Recovery Company (PERC) have all informed the Town of Brunswick that MSW could be accepted from November to April on a short term contract basis. In addition, Waste Management Inc. is willing to accept MSW from Brunswick during the summer months.

In the event of an emergency shutdown, the Town Council would authorize the Town Manager to sign a contract with an outside disposal facility. The Public Works Director would then arrange for the site work necessary for a transfer station at the landfill.

5. PUBLIC COMMENT

Notice of the application was published in the Times Record on March 27, 1991 and April 3, 1991. Written notice of the application was also sent to the owners of property contiguous to the project site. The notice invited interested persons to submit comments or request a public hearing.

Comments were received by the Capital Coastal Council of Governments. Although the Capital Coastal Council of Governments pointed out Brunswick's demonstrated ability to reduce waste and increase recycling, concern was raised over the Town's refusal to accept waste

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AGENCY REVIEW of PROPOSED
SOLID WASTE DISPOSAL FACILITY

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from other communities in the region. Based on its review of legislative policy as set forth in the Maine solid waste law, the Agency concluded that a regional approach is not required. A single municipality may develop disposal facilities to serve only the needs of its residents provided the disposal need cannot be reasonably met by existing disposal facilities.

A request for a public hearing was received from an abutter to the landfill. The concerns raised in the request relate to environmental issues within the purview of the Department of Environmental Protection. Therefore, the Agency determined that a public hearing was not appropriate. The comments were forwarded to the Department and a DEP public hearing notice was forwarded to the abutter.

BASED on the above Findings of Fact, the Maine Waste Management Agency CONCLUDES:

A. The proposed landfill expansion will meet capacity needs identified in the State Plan in addition to capacity that is under development by the Office of Siting and Disposal Operations under Title 38, M.R.S.A., section 2156 or by other facilities approved by the Agency at the time of this application;

B. The proposed landfill will be consistent with the State Plan; and

C. The proposed landfill is consistent with local, regional or state collection, storage, transportation, processing or disposal.

THEREFORE, the Agency APPROVES the application of the Town of Brunswick for the proposed expansion of the Graham Road landfill in Brunswick, Maine, in accordance with the following conditions:

A. **Approval of Changes to the Proposed Facility.** The granting of this approval is dependent upon and limited to the proposed landfill expansion described in the application and supporting documents submitted and affirmed to by the applicant. Any variation in the proposed landfill that increases or decreases its capacity, any change that alters the area served by the landfill and any change in the location of the facility is subject to review and approval by the Agency prior to approval by the Board of Environmental Protection. Changes in the engineering design of the landfill are not subject to Agency review and approval.

)F BRUNSWICK	6	AGENCY REVIEW of PROPOSED
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)ject Number: DF-0006-SL-E	)	FINDINGS of FACT and ORDER

B. **Compliance with All Applicable Laws.** The applicant shall secure and comply with all applicable federal, state and local license, permits, authorizations, conditions, agreements and orders, including the permit required from the Board of Environmental Protection under Title 38, M.R.S.A., section 1306(1), prior to or during construction and operation, as appropriate.

C. **Initiation of Development Within Three Years.** If the construction of the expansion is not begun within three years of the date of this order, this approval shall lapse and the applicant shall reapply to the Agency for a new approval.

D. **Transfer of Approval.** This approval may not be sold, assigned or otherwise transferred without the prior approval of the Agency. Such approval shall be granted if the applicant or transferee demonstrates to the Agency that the transferee intends to comply with the conditions of this approval.

ED AT AUGUSTA, MAINE THIS 27th DAY OF Sept., 1991.

MAINE WASTE MANAGEMENT AGENCY

BY: H E Warren

Henry E. Warren, Director
Office of Siting and Disposal Operations

ANY PERSON WISHING TO APPEAL THIS ORDER MUST DO SO WITHIN 20 DAYS OF THE RECEIPT OF THE ORDER. SEE ATTACHED SHEET FOR RIGHTS OF REVIEW AND APPEAL.

06-096 DEPARTMENT OF ENVIRONMENTAL PROTECTION

Chapter 400: GENERAL PROVISIONS

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contamination of any water of the State, contamination of the ambient air, a hazard to health or welfare, or a nuisance.

NOTE: All solid waste disposal facility expansions must comply with the siting and design requirements of these rules.

(2) Additional Criteria For Solid Waste Disposal Facilities. In addition to the above requirements, a new or expanded solid waste disposal facility is subject to the following:

(a) Public Benefit. The Department must determine in accordance with 38 M.R.S.A. section 1310-N(3-A) and section 5 of this chapter whether the solid waste disposal facility provides a substantial public benefit.

(b) Recycling and Source Reduction. Except for expansions of commercial solid waste landfills that accept only special waste, the Department must determine that the facility will be operated so that the volume of waste and the risks related to its handling and disposal have been reduced to the maximum practical extent by recycling and source reduction prior to disposal, as required under 38 M.R.S.A. section 1310-N(5) and section 6 of this chapter.

(c) Host Community Benefits and Intervenor Grants. The applicant must comply with the provisions required in section 7 of this chapter.

(d) Liability Insurance. The applicant must have proof of liability insurance as required under section 10.

(e) Financial Assurance. The applicant must meet the financial assurance requirements of section 11.

E. License Term and Annual Reporting Requirements. A solid waste license, issued pursuant to rules in effect on or after May 24, 1989, remains in effect unless modified, revoked or suspended under 38 M.R.S.A. section 341-D(3). Such a licensee is subject to the following licensing and reporting requirements:

(1) The licensee must:

(a) Comply with applicable operating rules;

(b) Pay the annual license fee pursuant to 38 MRSA section 352; and

(c) Comply with annual facility or activity reporting rules and pay all required reporting fees.

NOTE: Failure to pay an annual license fee within 45 days of the billing date contained in the Department's billing notification is sufficient grounds for modification, revocation or suspension of a license.

(2) Annual reports and annual reporting fees as required by the Department's rules shall be due on the following dates:

February 28
Chapter 419, Agronomic utilization of solid waste
Chapter 418, Beneficial use licenses
Chapter 409, Processing facility licenses

April 30
Chapter 401, Landfill facility licenses,
Chapter 403, Incineration facility licenses

October 31
Chapter 402, Transfer station facility and solid waste storage licenses, unless part of and reported with another facility.

F. **License Conditions.** The Department may impose any requirement as a license condition to assure compliance with State law or these rules. Standard license conditions for solid waste facilities are contained in Appendix 400. C.

4. **General Licensing Criteria.** This section contains general standards applicable to the licensing of solid waste facilities. This section also lists submissions required of applicants for new or expanded facilities in order for the Department to determine if the general licensing criteria are met. All applicants must demonstrate compliance with the criteria of this section and submit the listed submissions unless otherwise provided in the relevant facility chapter. Required submissions for amendments, minor revisions and limited permits will be determined by the Department on a case-by-case basis to determine if the proposal meets the relevant general licensing criteria.

A. Title, Right or Interest

(1) Standards. The applicant must demonstrate to the Department's satisfaction sufficient title, right or interest in all of the property which is proposed for development or use.

(2) Submissions. The applicant must submit evidence of sufficient title, right or interest as provided in Chapter 2, section 7(D).

B. Financial Ability

(1) Standards.

(a) The applicant must have the financial ability to design, construct, operate, maintain, close and (if applicable) accomplish post-closure care of the solid waste facility in a manner consistent with all applicable requirements.

(b) The applicant for a solid waste disposal facility shall provide adequate financial assurance for closure, post-closure care, and for corrective action for known releases in compliance with the financial assurance requirements of section 11.

Northeast SCALE COMPANY, INC.
88 PRISCILLA LANE UNIT 3
AUBURN, NH 03032-3748
(603) 622-0080

INVOICE

INVOICE #001952201
PAGE #01 BRU15

BILL TO: TOWN OF BRUNSWICK, ME
PUBLIC WORKS DEPT.
28 FEDERAL STREET
BRUNSWICK ME 04011

JOB LOCATION: LANDFILL SCALEHOUSE
GRAHAM RD, BRUNSWICK 0401
207-353-9781
CONFINED SPACE ON FILE

INVOICE DATE	OUR ORDER NO	YOUR ORDER NO	TERMS	SALESPERSON
12/07/04	001952201	MIKE CLAUS	NET 30 DAYS	RSI

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
	ME MUNICIPALITY TAX EXEMPTION		
	REGULAR SERVICE INSPECTION AND CALIBRATION OF TRUCK SCALE AT LANDFILL		
1.00	FLAT RATE CHARGE PER INSPECTION	285.00	285.00
1.00	PRORATE SHARE OF MOTEL, MEALS & TOLLS	46.80	46.80

PWD-PO# _____
Division 7520 Object 2260
Amount Approved 331.80
Date Approved 12/13
Approved By _____
140278

TOTAL 331.80

TERMS: NET 30, HOLD @ 45 DAYS, COD @ 60 DAYS

Thank You!

TERMS: NET 30 DAYS. 1½% MONTHLY INTEREST (18% PER ANNUM) CHARGED AFTER 30 DAYS.

Northeast SCALE
COMPANY, INC.
88 PRISCILLA LANE UNIT 3
AUBURN, NH 03032-3748
(603) 622-0080

WORK ORDER

00001952Ø
BRUIS

LL TO: TOWN OF BRUNSWICK, ME
PUBLIC WORKS DEPT.
28 FEDERAL STREET
BRUNSWICK ME 04011
(207) 725-6654 MIKE CLAUS

JOB LOCATION: LANDFILL SCALEHOUSE
GRAHAM RD, BRUNSWICK Ø401
207-353-9781
CONFINED SPACE ON FILE

DATE	OUR ORDER NO.	YOUR ORDER NO	NEXT INSPECTION DUE	
11/01/04	00001952Ø	MIKE CLAUS	MAY/NOV	DH

DESCRIPTION

ME MUNICIPALITY TAX EXEMPTION

REGULAR SERVICE INSPECTION AND CALIBRATION
OF TRUCK SCALE AT LANDFILL

1.00 FLAT RATE CHARGE PER INSPECTION

arrived onsite – inspected scale, checked Cal. made minor cal. adjustment. and cleaned drain. Scale working ok. at this time see report for more info.

OMMENTS: _____

EST TRUCK [X] PLACED IN SERVICE [X] YES PARTS INSTALLED [ ] YES
ERVICE TRUCK [ ] [ ] NO [ ] NO

ILEAGE _____ PARTS: _____

ECH: HW TECH: MJS

IN JOB LABOR: _____ HRS. ON JOB LABOR: _____ HRS.
RAVEL LABOR: _____ HRS. TRAVEL LABOR: _____ HRS.
HOP LABOR: _____ HRS. SHOP LABOR: _____ HRS.

ATE: 12/1/04 CUSTOMER SIGNATURE: [signature]

Thank You!

Northeast SCALE COMPANY, INC.
88 PRISCILLA LANE UNIT 3
AUBURN, NH 03032-3748
(603) 622-0080

Truck Scale Report

Customer: Town of Brunswick / Landfill
Address: Graham Rd.
City: Brunswick State: Me. Zip: 04011
Scale Mfg.: Cardinal
Capacity: 100 K Platform size: 10 x 3

MECHANICAL SCALE

Pit Condition: OK / Damp
Steel: OK
Drain Clean: Yes Sump Pump: —
Pivots & Bearings: OK
Platform Condition: OK
Connections Plumb: Yes
Levers Level: Yes
Proper Clearance: Yes
Deck Clearance: OK
Approach Level: Yes
Work Parts cleaned & greased: Yes
Scale Properly Grounded: Yes

ELECTRONIC INDICATOR

Model No.: 748P S/N: E06000-0207
Version No.:
Mfg.: Cardinal Asset No.:
Indicator Properly Grounded:

LOADCELL

Capacity: 1K
Mfg.: Rice Lake MV/V: 3
Model No.: S-Type
OHMS: 350

ELECTRONIC SCALE

Clean Ends:
heck Belting:
Check Rods:
Bumper Bolts:
Check Decks:
Check Bolts:
Check J-Box:
Change Dri-Pax:
No. of Loadcells:
Scale Properly Grounded:

SECTION TEST

As Found	As Sealed
21000	21000
21040	21000
20980	20980

PRINTER

Mfg.:
Model No.:
Serial No.:

TEST WEIGHTS APPLIED

Weights	Reading	Error	Adjustment
5000	5040	+40	-40
9000	9040	↓	↓
13000	13040	↓	↓
17000	17040	↓	↓
21000	21040		
Empty Truck		29700	
Test Weight		21000	
Should be		50700	
Error		8	

Work Order No.: 19522
Date Completed: 12/1/04
Scale Tech: HW
Scale Tech: MTB

REMARKS:

X _____ CUSTOMER SIGNATURE

-PINE TREE LANDFILL FACILITY DATA-

Type of Facility:	Subtitle D Landfill Double synthetic liner with leak detection and leachate collection
Location of Facility:	358 Emerson Mill Road Hampden, Maine 04930 Located off Exit 180 of Interstate 95
EPA ID Number	The facility does not generate hazardous waste, therefore it is not required to have an EPA ID number
Facility Contact Information:	Martin Drew, General Manager Tom Gilbert, Environmental Manager 358 Emerson Mill Road Hampden, Maine 04930 Tel: 207-862-4200 Fax: 207-862-2839
Facility Hours of Operation:	Monday – Friday, 6:00 AM – 7:30 PM Saturday & Sunday, 8:00 AM – 3:30 PM
Maine State DEP Contact:	Cyndi Darling Maine Dept. of Environmental Protection Bureau of Remediation & Waste Management 106 Hogan Road Bangor, Maine 04401 Tel: 207-941-4570
Violations in Last 3 Years:	No notice of violations in last 3 years
Date of Last Inspection:	Last site visit by the MDEP was in November 2004
Environmental Permits:	See attached list
Facility Scales:	Last Maine certificate issued in November 2001 Last scale inspection by Sabago Scales was in November 2004
Analytical Requirements:	See attached requirements

Pine Tree Landfill Permits

ORDER DATE	LICENSE/PERMIT NUMBER	PERMIT DESCRIPTION
MAINE DEP SOLID WASTE ORDERS:		
03/12/75	49-1987-19280	Site location & solid waste order
06/04/80	07-6707-19020	Operations manual-Asbestos
08/14/80	07-6707-19020	Amendment-I (Asbestos)
07/27/81	07-6707-19020	Amendment-II (Asbestos)
09/23/81	49-1987-19280	Site application modification
09/08/82	49-1987-10280	Oil fly ash secure landfilling
03/23/83	07-6707-19020	Amendment-asbestos
08/04/83	07-6707-19020	Amendment-asbestos
08/10/83	49-1987-19280	Modification
06/12/85	L-010396-07-A-N	Secure II landfill
12/18/85	L-010396-7-D-M	Secure II amendment
05/08/86	L-001987-AR-A	Secure I & II amendment and minor revision
05/08/86	L-010396-07-W-M	Secure I & II amendment and minor revision
03/23/87	L-010396-07-AL-M	Secure II special waste
08/27/87	L-001987-07-AV-M	Secure I closure
05/24/88	L-006707-07-A-A	Asbestos disposal
10/26/88	L-010396-07-BI-M	Secure II operational changes
06/08/89	S-010396-7D-BY-N	Jackson Lab burn debris
05/14/90	S-1987-7B-AX-M	Conventional landfill asbestos
07/11/90	S-10396-7A-CB-M	MSW incinerator by-pass
09/10/91	S-01987-7A-AY-R	Secure III
10/02/91	S-010396-7A-CP-M	PERC/MERC incinerator ash
10/11/91	S-10396-7A-CQ-M	Disposal of ash
12/06/91	S-10396-WD-CR-M	Minor revision (final grade)
01/22/92	S-05017-WU-D-M	Tire shredder waste disposal
09/04/92	S-20762-WK-A-N	Processing facility
04/16/93	S-10396-WU-DT-M	Minor revision (ash mix)
01/12/94	S-01987-WD-BK-M	Minor revision (oily debris)
05/06/94	S-01987-WD-BM-M	Minor revision (leather scrap)
07/15/94	S-01987-WD-BN-M	Minor revision (filter press cake)
08/03/94	S-010396-WN-CU-N	New license (Secure II closure)
12/28/94	S-01987-WD-BO-M	Minor revision (ash)
06/16/95	S-01987-WD-BP-M	Minor revision (sludges)
11/20/95	S-001987-WR-GX-T	Transfer of licenses
02/14/96	S-020762-WK-B-T	Transfer of license (processing)
03/29/96	S-001987-WD-BQ-M	Minor revision (CDD residuals)
06/05/96	S-01987-WD-BR-M	Gas monitoring
12/04/96	S-01987-WD-BT-M	Vanadium ash
05/09/97	S-01987-WD-BU-M	Pigeon waste
06/26/97	S-01987-WD-BV-M	Water/air filtration media
08/07/97	S-020762-WK-C-M	Minor revision (processing facility)
12/11/97	S-01987-WD-GY-M	Non-hazardous chemical products
04/28/98	S-021816-WK-A-N	CDD Facility & Transfer Station
04/28/98	S-01987-WD-HA-M	Oversized bulky wastes
09/01/98	S-01987-WD-IB-M	Leachate storage tank
09/23/98	S-01987-WD-IA-M	Disposal of FEPR
10/12/98	S-001987-WD-GZ-N	New license
03/24/99	S-001987-WD-GZ-N	Secure III expansion
12/06/99	S-01987-WD-JA-M	Phase VIII-A
02/01/00	S-001987-WD-LA-C	Compliance conditions #7 & #9

Pine Tree Landfill Permits

ORDER DATE	LICENSE/PERMIT NUMBER	PERMIT DESCRIPTION
MAINE DEP SOLID WASTE ORDERS(CONT.):		
03/15/00	S-001987-WD-MA-M	Cold weather liner system
07/13/00	S-001987-WD-NA-M	Perimeter dike re-construction
02/28/01	S-001987-WD-PA-M	Condition compliance & minor revision
04/23/01	S-001987-WD-RA-C	Compliance with condition #7
06/25/01	S-001987-WD-SA-M	Active gas system
02/26/02	S-001987-WD-QA-M	MSW & public benefit
07/11/02	S-001987-WD-VA-M	Closure phases I-V
08/21/02	S-001987-WD-QA-M	Minor revision (corrected copy) MSW & public benefit
08/29/02	S-001987-WD-XA-M	Construction of phase VIII-C, stage 1
02/18/03	S-001987-WD-YA-M	Virgin oil contaminated soil revision
04/17/03	S-001987-WD-CA-M	Secure III, phase VIII-C, stage 2 construction
04/18/03	S-001987-WD-CB-M	Secure III, phase VI gas system installation
08/29/03	S-001987-WD-ZA-M	WTP sludge, dredged spoils, & burnt railroad ties
12/18/03	S-01987-WD-WA-M	Urban Fill Contaminated Soils & debris
01/02/04	S-01987-WD-EB-M	Change in analytical requirements (sludges & ash)
05/11/04	S-001987-WD-FB-M	Secure III, phase VIII-C, stage 3 construction
05/16/04	S-001987-WD-GB-M	Secure III - New force Main Installation
10/15/04	S-001987-WD-JB-M	Secure III, phase VIII-C, Stages 1 & 2 Gas System
MAINE DEP AIR LICENSE:		
06/09/03	A-850-70-A-I	Title V Air License for Landfill and co-generation
		unit to generate electricity with landfill gas
TOWN OF HAMPDEN PERMITS:		
12/03/90	NA	Conventional & Secure ii Landfills
10/07/91	NA	Secure III-Phases I-V
12/13/93	NA	Side Slope Expansion
11/07/94	NA	Secure III-Phases I-V Renewal
08/23/99	NA	Secure III-Phase VIII-A (Planning Board)
10/18/99	NA	Secure III-Phase VIII-A (Town Council)
01/18/00	NA	Secure III-Phase VIII-A (Amendment)
12/18/00	NA	Secure III-Phases VI, VII, & VIII-B
03/28/01	NA	Secure III-Phases VI, VII, & VIII-B (Planning Board)
11/14/01	NA	Secure III-Phase VIII-C (Planning Board)
12/10/01	NA	Secure III-Phase VIII-C (Town Council)
EPA PERMITS:		
02/21/01	MER05A778	NPDES Storm Water Multi-Sector Permit
WASTEWATER DISCHARGE PERMIT:		
08/09/04	S018	City of Bangor Industrial Wastewater Discharge
		Permit For Landfill Leachate
U.S. Fish & Wildlife Permit:		
10/01/01	MB670894-0	Depredation Permit for Shooting of Gulls
12/12/02	MB670894-0	Renewal
03/03/04	MB670894-0	Renewal
10/28/04	MB670894-1	Amendment to add WOTL to PTL Permit

Special Waste Acceptance - Analytical Requirements (MDEP Blanket Permits)

PINE TREE LANDFILL
358 Emerson Mill Road
Hampden, Maine 04444
Tel: (207) 862-4200
Fax: (207) 862-4207

-PINE TREE LANDFILL CONTACTS-

Tel: 207.862.4200
Fax: 207.862.4207

Martin Drew, General Mgr. (Pricing) ext. 224
Tom Gilbert, Envirn. Mgr. (Waste Acceptance) ext.223
Betty Robinson, (Manifests & Scheduling) ext.221

	TCLP Metals (1311)	TCLP-Lead Only (1311) 7420/6010	TCLP-Benzene Only (1311) 8260	TCLP Vanadium (1311) 7910/7911	TCLP Volatiles (1311) 8260	TCLP Semi-Volatiles (1311) 8270	TCLP Pesticides (1311) 8082	TCLP Herbicides (1311) 8150	TOX (9020B/9022) or 8260	Flashpoint (1010)	pH (Corrosivity) (9045C)	Total PCB's (8082)	Sulfide Reactivity (7.3.4.2)	Dioxins and Furans (SW-846)	Cyanide Reactivity (7.3.3.2)	Chloride (9056) SW8	Phosphorus (4500P) STM	% Carbon (D5291)	% Moisture/Free Liquids (9095A)	Sampling Requirements & Notes
sh Related Wastes																				
ood\Biomass Boiler Ash	X																			Initially, then annually for <200 tons per year, quarterly >200 TPY
ssil Fuel Boiler Ash	X			X																Initially, then annually for <200 tons per year, quarterly >200 TPY
ean Wood Open Burn Ash	X																			Initially, then annually for <200 TPY, otherwise every 200 tons.
unicipal Solid Waste Ash (MSW)	X													X						Initially, then every 200 tons for first 1000 tons, or quarterly if more frequent.
medical Incinerator Ash	X																			Initially, then every 100 tons or annually, whichever is more frequent.
rned RR ties & associated ash	X				X	X						X								Initially, then every 250 tons.
ontaminated Soil and Debris																				
soline contam. Soil & debris (UST)		X																		One per source or 500 tons, whichever is more frequent.
soline contam. surface spill		X	X																	One per source or 500 tons, whichever is more frequent.
aste oil contam. UST or surface	X				X	X	X	X	X	X	X	X	X		X					One per source or 250 tons, whichever is more frequent.
oan Fill Type Soils & Debris	X				X	X	X	X		X	X	X	X		X					Once per 250 tons <1000 tons, once per 500 tons >1000 tons w/no fewer than 4
edged Spoils	X				X	X	X	X				X	X							Initially, then every 250 tons
gin petroleum product contam. S & D*	X																			One per source or 500 tons, whichever is more frequent.
udges& Related Wastes																				
er press cake & collagen scrapings	X				X	X	X	X												Initially, then TCLP-metals only on an annual basis.
lp & Papermill Sludge	X				X	X	X													Initially, then quarterly for TCLP-metals and annually for TCLP-Vols. & Semivols..
blic Waste Treatment Plant Sludge	X				X	X														Initially, then quarterly for TCLP-metals and annually for TCLP-Vols. & Semivols..
mmercial & industrial laundry sludge	X				X	X	X	X					X							Initially, then TCLP-metals only on an annual basis.
ater Treatment Plant Sludge	X				X	X	X	X					X							Initially, then annually thereafter.
iscellaneous Special Wastes																				
ndblast Grit	X																			Initially, then annually <50 tons, per event 50-100 tons, >100 tons every 500 tons
bestos (non-friable type only)																				Managed in accordance with Maine asbestos rules
ather Scrap Wastes	X																			Initially, then annually.
nstruction & Demolition Debris																				No analysis required, if not contaminated with regulated substances.
tch Basin Grit																				No analysis required, if not contaminated with regulated substances.
& Water Filtration Media																				No analysis required, if not contaminated with regulated substances.
proved Land Utilization Wastes																				No analysis required, if material fits DEP land utilization criteria.
ont-End Process Residue (FEPR)																				No analysis required.
ersized Bulky Wastes																				No analysis required.
geon Waste																				No analysis required. Waste must be wet down and contained .
f-Spec. Spent, or Spilled Chemicals																				No analysis required if msds available to confirm non-hazardous status.
unicipal Solid Waste (MSW)																				No analysis required

ote: Virgin petroleum product contaminated soil & debris may be disposed of without the normal analyticals
if the cleanup is supervised by the Maine DEP and/or another State's regulatory authority, and a letter of authorization is obtained.

casella
waste systems, inc.

APPROVAL NO.

-SPECIAL WASTE CHARACTERIZATION PROFILE FORM-

PROPOSED DISPOSAL FACILITY

☐ **NEW ENGLAND WASTE SERVICES OF ME** **DBA Pine Tree Landfill** **358 Emerson Mill Road** **Hampden, Maine 04444** **Tel: 207-862-4200, ext. 223** **Fax: 207-862-2839**	☐ **NEWSME LANDFILL OPERATIONS LLC** **West Old Town Landfill** **Route 16** **West Old Town, Maine 04468** **Tel: 207-862-4200, ext. 223** **Fax: 207-862-2839**

WASTE GENERATOR INFORMATION

Generator/Site Name:	Generator/Site Address:	Contact Name: Tel: Fax:
Owner Name:	Mailing Address:	Contact Name: Tel: Fax:
Consultant or Representative:	Mailing Address:	Contact Name: Tel: Fax:
EPA Superfund Site?	Local or State DEP Supervised Cleanup?	Contact Name: Tel: Fax:

SPECIAL WASTE DISPOSAL DATA

Waste Description or Category:
Urban Fill Contaminated Soil & Debris

New MDEP Permit Required? No	Existing Generator/Facility Permit #: #S-001987-WD-WA-M
Quantity of Waste Requiring Disposal: Tons Cubic yards	
Onetime or Ongoing Disposal Proposed:	Frequency of Deliveries:

Special Handling, Shipping, Analytical, and/or Disposal Requirements:
One composite sample every 250 tons for 1,000 tons or less, and one sample every 500 tons for greater than 1,000 tons must be analyzed for the parameters checked off on page-2.

SPECIAL WASTE ANALYTICAL REQUIREMENTS

	No Analyticals Required	X	Total PCB's
	Material Safety Data Sheet (MSDS)	X	Ignitability/Flashpoint
X	TCLP Metals	X	Sulfide Reactivity
	TCLP Lead	X	Cyanide Reactivity
	TCLP Benzene		Dioxins and Furans
	TCLP Vanadium		Chloride
X	TCLP Volatile Organics		% Carbon
X	TCLP Semi-Volatile Organics		% Moisture
X	TCLP Pesticides		Phosphorus
X	TCLP Herbicides	X	Ph/Corrosivity
	Total Organic Halogens (TOX)		Other ( )

* Sample(s) must be analyzed in accordance with the most recently approved EPA method(s) for solid wastes and testing performed by a State certified laboratory.

APPROVAL STATUS

The above waste stream has been approved for disposal at the facility designated on page one of this profile. The terms of acceptance at the designated facility are based upon the waste being representative of the laboratory test results provided by the generator or their representative.

Approved By:

Tom Gilbert
Environmental Compliance Manager
Casella Waste Systems, Inc.

_____ Signature

_____ Date

GENERATOR CERTIFICATION

To the best of my knowledge, as the party responsible for obtaining representative samples and having them analyzed for the parameter(s) specified above, I certify that the attached analytical data is representative of the material being proposed for disposal at Pine Tree Landfill or West Old Town Landfill, and that both the sample collection technique, and analysis were preformed in accordance with procedures identified in U.S. EPA Document SW-846 "Test Methods for Analysis of Solid Waste," 3rd Edition, 1986, unless otherwise specified. Additionally, if this special waste is being disposed under a previously approved individual permit I certify that the process or fuel mix generating the waste has not changed to the extent that it would alter the original characteristics as approved in the permit.

_____ Name (signature)

_____ Date

_____ Title

_____ Company

Please forward completed Generator Certification form to: **Tom Gilbert**
Pine Tree Landfill
358 Emerson Mill Road
Hampden, Maine 04444

The completed form may also be returned by fax to: 207-862-2839

ENPRO – Disposal Facility, RCRA TSDF for Hazardous Liquids

ENPRO Services of Maine, Inc.
106 Main Street
South Portland, ME
Tel: 207.799.0850
Fax: 207.799.5565

FACILITY US EPA ID NO. MED019051069

Permits:

RCRA Part B Hazardous Waste and Waste Oil TSDF and 10-day Transfer Facility permit (combined), License #O-000017-H1-J-R, #O-000017-HR-J-R & #O-000017-97-G-R
Expires May, 2009

Industrial User Wastewater Discharge Permit N0. 005
Expires December, 2006

City of South Portland Waste Flammable Liquids License N. 13094
Expires April, 2006

The date of the last inspection was an informal one August 2004; deficiencies are identified below.

There is no weight scale at the ENPRO Services of Maine facility

Facility POC – Dave Grant (207) 799-7377

Regulatory POC – LeeAnn DelMonte (800) 966-1102

ENFORCEMENT AND/OR COMPLIANCE ACTIONS

Compliance Notifications since those set forth in the 1995 permit renewal application include one Notice of Violation from the Maine Department of Environmental Protection on December 21, 1999; and the following Notices of Noncompliance from the City of South Portland regarding wastewater discharge permit limit exceedances:

3-4-96	Exceeded limit for Cyanide
5-14-96	Exceeded limit for Mercury
7-1-96	Exceeded limit for Oil and Grease
7-15-97	Exceeded limit for Cyanide
11-18-96	Exceeded limit for Oil and Grease
5-12-98	Exceeded limit for Copper
2-13-01	Exceeded limit for Nickel and Cyanide
8-01-01	Exceeded limit for Cyanide
11-09-04	Exceeded limit for Copper & Nickel

All Notices of Noncompliance were resolved and the facility is currently in compliance with all of its permits and limits.

The last inspection by Maine DEP was an informal inspection of on-going improvements at the facility, in August of 2004.

Response to MEDEP Comments Dated July 21, 2005

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Site Work Plan, Site 9 Soil Removal Action FFP", dated July 6, 2005, prepared by Oak Environmental Consultants, Incorporated. Based on that review MEDEP has the following comments and issues.

General Comments:

1. This document lacked the critical information on the removal of the ash landfill/dump. This information must be provided for review and comment as part of the workplan.

   Response: *Additional information has been incorporated into the workplan.*

2. Please submit figures of the location of site 9 and the limits of the proposed removal action.

   Response: *The figures were inadvertently omitted from some copies of the draft work plan. These figures have been provided, are attached, and are included in the Final Work Plan. The limits of the proposed removal action are based on previous investigations and are those presented in the Direct Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9, Naval Air Station, Brunswick, Maine, November 2004.*

3. The workplan must include a section on groundwater is to be handled if it is encountered during the removal action.

   Response: *A new section has been inserted into the Work Plan (Section 10) to specifically address water encountered in the excavation, as follows:*

10.0 HANDLING OF WATER IN EXCAVATION

Any water pumped from the excavation will be containerized (e.g., frac tanks). Specifically, Oak anticipates that two, 20,000 gallon frac tanks will be needed to handle the construction water. The water will be tested and disposed of in accordance with federal, state and base requirements. As noted in the workplan, EMI has been identified as an appropriately permitted transporter and disposal facility for liquid wastes. Based on the chemical quality of the water, the Navy may elect on-site treatment of the water using a combination of filters (e.g., particulate, carbon). If on-site treatment is performed, post-treatment chemical analyses of water will be performed prior to discharge. Any discharge of treated water will be coordinated with BNAS Water Resources, and treated water concentrations will meet MEDEP drinking water standards and/or other applicable standards (e.g., Maine Maximum Exposure Guidelines for discharges to the ground, and Ambient Water Quality Criteria for discharges to surface water bodies). Also, standard construction approaches will be used to minimize the quantities of water pumped from the excavation. This will include use of materials in the excavation to create temporary sumps and/or dams to control/contain excavation water and facilitate excavation activities.

---------- End of Section 10.0 ----------

4. Through this document "soil removal" is referenced. The removal action is for the ash landfill and dump material. MEDEP recommends clarifying that ash, debris and soil will be removed as part of this removal action.

Response: *The document has been revised to refer to the materials being removed as ash and/or dump debris, including co-mingled soils.*

2.0 STATEMENT OF WORK

This Work Plan outlines the procedures for excavation and off-site disposal of approximately 16,000 cubic yards of ash, debris and co-mingled soils.

Specific Comments:

5. Title Page:

a.) The title should clearly define the work proposed therefore MEDEP suggests the following title: *Site 9 Ash Landfill/Dump Removal Action.*

Response: *The Work Plan title has been revised accordingly to* "Site 9 Ash Landfill/Dump Removal Action."

b.) If the FFP acronym is important to the title it must be written out.

Response: *FFP has been deleted from the title.*

6. "Statement of Work, para 1:

"In addition, concrete pads and utility lines in the area of the project will be removed and/or capped as part of the excavation activities."

It is MEDEP's understanding that the barracks were removed down to their concrete pads. If this is correct then the pads for the old barracks must be removed in order to fully excavate the ash landfill and dump. If the concrete pads for the barrack had all ready been removed please identify what concrete pads are being discussed.

Response: *The text has been revised to delete reference to concrete pads. Rather, these former concrete pads have been crushed, and concrete rubble from 4 inches to 8 inches in size remains at the surface and will be removed, along with the foundation walls and footings. The text now reads as follows*:

"The work also includes the following: removal of concrete debris at the surface consisting of 4 inch to 8 inch pieces of concrete remaining from the recently completed building pad demolition (former Buildings 217 through 220), ..."

7. Laboratories, Table:

MEDEP does not have clean up levels by these titles: "MEDEP Soil Cleanup Limits and MEDEP Soil Criteria for Direct Contact". Therefore the actual reference must be cited for MEDEP to evaluate the appropriateness.

Response: *The Table titles have been revised as follows: "Detection Limits for Waste/Soil Samples" and " Detection Limits for Water/Aqueous Samples." These tables show the detection limits that the laboratories will be contractually required to meet for this project. As*

shown, these detection limits are adequate to meet the Maine Remedial Action Guidelines and EPA Region IX PRGs/SSLs for soils (which have been incorporated into the tables, and are identified in Section 7.3 – Confirmatory Samples as the cleanup standards for soils) and the Maine Maximum Exposure Guidelines. The beginning of Tables C-1 and C-2 are shown below.

Table C-1: Detection Limits for Water/Aqueous Samples

(representative lists based on Target Compound List for organics)

Target List	Aqueous Accuracy % Recovery	Aqueous Precision RPD (1)	Water PQLs (ppb)	Water MDLs (ppb)	Maine MEGs ppb	EPA MCL ppb	AWQC ug/L
Volatile Organic Compounds - EPA Method 8260B							
Chloromethane	35-145	0-20	2	0.30	3	5	N/A
Bromomethane	57-139	0-20	2	0.58	10	N/A	N/A
Vinyl Chloride	48-132	0-20	2	0.30	0.2	2	N/A
Chloroethane	48-132	0-20	2	0.34	N/A	N/A	N/A
Acetone	65-156	0-20	5	1.98	700	N/A	N/A
Acrolein	62-117	0-20	10	1.28	N/A	N/A	N/A
1,1-Dichloroethene	88-123	0-20	1	0.36	0.6	7	N/A
Methyl tert-butyl ether	68-127	0-20	2	0.77	35	35	N/A
1,2-Dichloroethene (trans)	83-121	0-20	1	0.29	140	100	N/A
1,1-Dichloroethane	80-118	0-20	1	0.40	70	N/A	N/A
1,2-Dichloroethene (cis)	85-113	0-20	1	0.26	70	70	N/A

Table C-2 - Detection Limits for Soil/Solid Samples

(Partial List for VOCs/SVOCs Based on Target Compound List)

Target List	Soil Accuracy % Recovery	Soil Precision RPD (1)	Soil PQLs (ppb)	Soil MDLs (ppb)	Maine RAG Residential	EPA PRG Residential	EPA SSL DAF 1
Volatile Organic Compounds - EPA Method 8260B					mg/kg (ppm)		
Chloromethane	36-165	0-30	5	0.97	13	47	N/A
Bromomethane	43-181	0-30	5	2.00	N/A	3.9	0.01
Vinyl Chloride	47-159	0-30	5	1.80	0.04	0.07	0.01
Chloroethane	54-157	0-30	5	1.48	N/A	3	N/A
Acetone	44-226	0-30	25	4.17	475	14000	16
Acrolein	44-146	0-30	25	2.58	N/A	0.1	N/A
1,1-Dichloroethene	68-141	0-30	5	1.00	0.2	120	0.06
Methyl tert-butyl ether	11-259	0-30	10	0.66	N/A	32	N/A
1,2-Dichloroethene (tran)	72-133	0-30	5	0.90	135	69	0.03
1,1-Dichloroethane	75-130	0-30	5	1.06	645	510	1

8. Method To Stockpile Soil, bullet 2:

"There are no drainage ditches, culverts, or other surface drainage features currently identified in the area."

The term "area" needs to defined, because there is a drainage area and impoundment ponds within the area designated as Site 9. However the head of the drainage area is approximately 140 feet from the ash landfill/dump. Please clarify this bullet.

Response: *The text has been revised as follows:*

"There are no drainage ditches, culverts, or other surface drainage features present within the anticipated work area."

Further, the work area is defined in the Work Plan as bounded by Orion Street to the west, Wyman Park to the north, the parking lot to the east, and Avenue C/Neptune Drive to the south. The boundaries of the work area are also shown in Figure 3. Further, as described in the Work Plan, erosion control measures will be in place to prevent runoff of materials from the work area. Should drains or other potential drainage pathways be identified in the work area, appropriate erosion control actions will be taken in accordance with Maine Best Management Practices for erosion control.

9. Confirmatory Samples:

This section needs to address where, what type of sample and how the sample will be taken.

Response: *Section 7.0 includes a description of the approach and methodology for collection of confirmatory samples as well as a summary of the sampling, as follows:*

7.0 SAMPLE COLLECTION

The primary sampling matrix at the site will be soils. As identified in Section 5.0, these soil samples will be of the waste stockpiles, backfill, and confirmatory samples of the excavation. In addition, some water samples will be collected of decontamination fluids and water removed from the excavation. Sampling at the site will be performed in accordance with the following existing document for Site 9:

> Long-Term Monitoring Plan, Site 9 (Neptune Drive Disposal Site), Naval Air Station, Brunswick, Maine, Final, August 1999 – including Appendix A – Standard Operating Procedures for Field Sampling and Appendix B – Quality Assurance Project Plan

A summary of the types of samples being collected and the chemical analyses to be performed as well as QA/QC samples is provided in Table 1.

Table 1 – Summary of Sample Types, Chemical Analyses and QA/QC Samples

	Project Samples			
	Waste Stockpile	Backfill	Excavation Confirmatory	Containerized Fluids
Media	Soil/Solid	Soil	Soil	Water

Sample Type	Composite	Composite	Grab	Grab
Chemical Analyses (w/EPA Method Number)				
TCLP Extraction - 1311	X			
VOCs – 8260	X			
SVOCs - 8270	X			
Metals - 6010	X			
Pesticides/Herbicides - 8081	X			
PCBs - 8081	X			X
TPH DRO/GRO (Maine Methods 4.1.25 and 4.1.17)	X	X		
VOCs – 8260		X	X	X
SVOCs - 8270		X	X	X
RCRA Metals - 6010		X	X	
Priority Pollutant Metals - 6010				X
QA/QC Backup				
Level III Data Package	X	X	90%	X
Level IV Data Package			10%	
QA/QC Samples (per QAPP)				
Duplicates			10%	
Matrix Spike/Matrix Spike Duplicates			5%	
Trip Blanks			1 Per Batch	
Rinsate Blanks			1 Per Week*	

*Note: This is more frequent than QAPP.

Accurate tracking of sample collection and correlation of analytical data with soil stockpiles is critical for the execution of this project. Sample tracking and documentation will include the following:

- A systematic numbering methodology (with the prefix S9 to refer to this project) where each sample has a unique identification number (ID),
- Recording of all samples collected in the field notebook.
- Completion of a chain-of-custody for each sample set (and maintenance of sample chain-of-custody).
- Preparation of a site sketch, in the field, on the day of sample collection, annotated with sample locations and identification numbers.

Specific aspects of our sample locations as well as tracking and documentation for the different types of samples are discussed below.

7.1 Waste Stockpile Samples

Sections of the waste stockpiles will be numbered sequentially (P1 through P32). Further, upon completion of a 500 cubic yard section of stockpile, water resistant placards will be placed at two locations along the slopes of the soil pile, underneath the poly sheeting used to cover the pile. In addition, a placard with the pile ID will be staked into the ground adjacent to the soil pile, outside the poly covering. The location of the soil stockpile and associated ID will be annotated on a site sketch maintained in the field.

Per the project specification and consistent with waste disposal facility criteria, Oak will

collect a minimum of one 4-point composite per 500 cubic yards of waste. In general, two of the composite locations will be along the flanks of the pile and two will be on or near the crown of the pile (Figure 4). The approximate location of each sample used to generate a composite will be recorded in the field notebook. More than one composite sample per 500 cubic yards may be needed to meet disposal facility permit requirements. Each separate composite sample from a stockpile will be created from different sample locations on and within the pile. An example of the sample ID is as follows: S9-P1-1 (site ID – pile ID – sample number). The sample ID along with the field notes, annotated site sketches and pile placards will allow for accurate tracking of sample results with individual soil piles.

7.2 Backfill Samples

Each source of backfill materials will be given a unique ID, which will be recorded in the field notebook. Backfill will be certified clean fill based on direct chemical analyses of the materials being used for backfill. Samples collected at each source of backfill materials will be numbered sequentially. If more than one type of material is sampled at a given source, then the sample ID will reflect the material sampled (e.g., S9-Source1-sand1, S9-Source1-gravel1). A description of the sample location and/or a field sketch will be recorded in the field notebook.

7.3 Confirmatory Samples

The results of the confirmatory samples will be evaluated using both the Maine Remedial Action Guidelines for soils and EPA Region IX Preliminary Remediation Goals and Soil Screening Levels (Attachment F) as general guidelines. The goal of the ash and debris removal action is to show that the overall site-wide risk to human health and the environment is reduced to acceptable levels. To achieve this, the Navy intends to collect approximately ninety-six (96), discrete, grab samples as follows:

- Collect a set of two sidewall samples for every 32 linear feet of excavation wall;
  - one sidewall sample will be collected from varying depths ranging from 0 to 6 feet,
  - the second sidewall sample will be collected two feet above the excavation bottom,
- Collect a sample along the floor of the excavation for every 1,024 square feet (or a 32 foot square grid).
- Perform a post-excavation risk assessment to confirm that remaining soils do not pose an unacceptable risk, as necessary.

Sample locations will also factor in visual observations in the field (e.g., soil coloring, presence/absence of ash, soil type, etc...). The initial confirmatory sample locations, based on the anticipated areas of excavation, are shown on Figure 4a, and represent the minimum number of samples to be collected. Additional samples may be collected based on excavation geometry, field observations, and laboratory results.

Confirmatory samples will be analyzed for the following parameters: VOCs via Method

8260, SVOCs via Method 8270, and total RCRA metals via Method 6010B. As noted previously, detection limits will be sufficiently low to determine whether soils remaining in place meet Maine DEP and EPA Region IX guidelines for cleanup. Each confirmatory sample will be a grab sample from a specific location. Additional excavation may be warranted based on initial results of confirmatory sampling. In this instance, additional confirmatory samples will be collected from newly excavated areas. The confirmatory sample results will be presented in a data package meeting EPA and Maine requirements for data validation and risk assessment, including all laboratory and field QA/QC samples.

Three types of information will be tracked for each confirmatory sample location: horizontal position, sample type (sidewall vs. bottom), and sample depth.

- To track horizontal position, a 32-foot grid will be established in the field. One axis will be parallel to Wyman Park and Avenue C and be given an alpha character, beginning with A. The second axis will be perpendicular to the first axis and be numbered, beginning with 1. The horizontal location will be then be assigned in the field based on this grid, using both an alpha and numeric character to identify a specific grid area (e.g., A5, D2). In addition, it is likely that there will be more than one sample per sample grid (at different depths). So, samples from the same sample grid will also be assigned a sequential number.
- The type of sample will be either an SW for sidewall or B for bottom sample.
- The approximate depth of the sample, in feet, will be recorded and used in the sample ID, immediately following the sample type. For example, the sample ID of S9-D2-SW4-1 will be the first sample from grid D2, from the sidewall at a depth of 4 feet.

The above information will be recorded in the field notebook, will be annotated on site sketches, and will be used throughout the sample labeling and chain-of-custody process.

----- End Section 7.0 -------

10. Unanticipated Waste:

    MEDEP was pleased to see that the contractor address the potential for unexploded ordnance. No response required.

11. ACM

    a.) "This will be particularly important for the portion of the project involving abandonment of utility lines since older utility materials have a greater potential for containing ACM."

    This statement seems outside the scope of this removal action. Please explain.

    Response: *As noted in Section 2 – Statement of Work, the planned activities include removal and abandonment of utility lines in the work area associated with former buildings 217 through 220. It is these activities which have the greatest potential to encounter ACM.*

b.) "Further handling of the materials will be based on the findings of the asbestos inspector."

Please reference the rules and regulations which will govern the handling of the asbestos containing material.

Response: *A reference to Maine Chapter 425 Asbestos Management Regulations has been added to the Work Plan, as follows:*

> "As required, procedures specific for the continued excavation, handling and disposal of ACM will be provided as an amendment to this Work Plan and SHSP, per Maine Chapter 425 Asbestos Management Regulations."

12. Detailed Schedule:

Figure 1 was not included; please provide.

Response: *The figures, including the schedule, are included with the Work Plan.*

13. Spill Prevention and Response:

"All spills will be reported to the Navy and addressed as required by Maine DEP requirements."

Please reference the rules and regulations which govern the reporting and handling of spills in the State of Maine.

Response: *A reference to Maine Chapter 800 Hazardous Materials Identification has been added, as follows:*

> "All spills will be reported to the Navy and addressed as required by Maine DEP requirements in accordance with Maine Chapter 800 Hazardous Materials Identification."

14. HASP:

MEDEP requires that a Health and Safety Plan be included as part of the workplan however MEDEP is not responsible for enforcing the Health and Safety Plan. However MEDEP made the following observation in regards to this HASP. (No response required.)

15. Section 4.1, Potential Chemical Hazards:

This section refers to the MCP soil standards. MEDEP is unfamiliar with this acronym please define.

Response: *The text has been revised to refer to EPA Region IX Preliminary Remediation Goals for soils at industrial sites.*

16. Section 4.4, List of Potential..., Bullet 4:

The last sentence is incomplete.

Response: *The last sentence has been amended to read as follows: "Daily tailgate meetings will address the planned heavy equipment operations for the day."*

17. Appendix B, Material Safety Data Sheets:

    Diesel Range Organics and Gasoline Range Organics MSD sheets are included however none of the MSD sheets for the Contaminants of Concern, VOCs, ash (dioxins) etc are included. These must be included in this section.

    Response: *An MSDS has been added for fly ash as representative of the ash materials that are expected to be encountered. In addition, MSDS's have been added for select VOCs (TCE, DCE and vinyl chloride); however, MSDS's are prepared for handling and response to pure and/or high concentrations of these VOCs and are not representative of low concentrations of VOCs in soils and water, such as those present at Site 9.*

18. Attachment C, Tables:

    MEDEP could not review the appropriateness of these tables since it is unclear what these tables represent. Please put the appropriate title on them."

    Response: *See Response to Item 7 above; The Table titles have been revised as follows: "Detection Limits for Waste/Soil Samples" and " Detection Limits for Water/Aqueous Samples." These detection limits are adequate to meet the Maine Remedial Action Guidelines and EPA Region IX PRGs/SSLs for soils and the Maine Primary Drinking Water standards.*

END OF MEDEP COMMENTS JULY 21, 2005

Response to EPA Comments Dated July 25, 2005

Pursuant to the Naval Air Station Brunswick, Maine Federal Facility Agreement dated October 19, 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject document and comments are below:

1. This document is incomplete and must be re-submitted.

   Response: *A revised document is being submitted.*

2. EPA agrees with the MeDEP comment letter dated July 21, 2005, please provide a copy of all responses to both MeDEP and EPA.

   Response: *Responses have been provided to all comments received.*

3. This document lacks both a sampling and analysis plan (SAP) and a project specific quality assurance project plan (QAPP). The project's sampling and laboratory quality control criteria need to be added to the appropriate sections of the Plan and the laboratory's quality assurance/quality control manual needs to be attached to the Plan or referenced if the Navy has previously submitted these to EPA. If the Navy intends for this contractor to follow the Site QAPP, then the Site QAPP must be referenced also, otherwise the information must be included in this document or the SAP.

   Response: *Section 7.0 of the Work Plan has been expanded to address requirements of an SAP as they relate to sample type, sample location, sample tracking, and chemical analyses to be performed. In addition, the work will be completed in accordance with the existing Site QAPP. A reference to this QAPP has been added to Section 7.0. The revised Section 7.0 is provided below.*

7.0 SAMPLE COLLECTION

The primary sampling matrix at the site will be soils. As identified in Section 5.0, these soil samples will be of the waste stockpiles, backfill, and confirmatory samples of the excavation. In addition, some water samples will be collected of decontamination fluids and water removed from the excavation. Sampling at the site will be performed in accordance with the following existing document for Site 9:

> Long-Term Monitoring Plan, Site 9 (Neptune Drive Disposal Site), Naval Air Station, Brunswick, Maine, Final, August 1999 – including Appendix A – Standard Operating Procedures for Field Sampling and Appendix B – Quality Assurance Project Plan

A summary of the types of samples being collected and the chemical analyses to be performed as well as QA/QC samples is provided in Table 1.

Table 1 – Summary of Sample Types, Chemical Analyses and QA/QC Samples

	Project Samples			
	Waste Stockpile	Backfill	Excavation Confirmatory	Containerized Fluids
Media	Soil/Solid	Soil	Soil	Water
Sample Type	Composite	Composite	Grab	Grab
Chemical Analyses (w/EPA Method Number)				
TCLP Extraction - 1311	X			
VOCs – 8260	X			
SVOCs - 8270	X			
Metals - 6010	X			
Pesticides/Herbicides - 8081	X			
PCBs - 8081	X			X
TPH DRO/GRO (Maine Methods 4.1.25 and 4.1.17)	X	X		
VOCs – 8260		X	X	X
SVOCs - 8270		X	X	X
RCRA Metals - 6010		X	X	
Priority Pollutant Metals - 6010				X
QA/QC Backup				
Level III Data Package	X	X	90%	X
Level IV Data Package			10%	
QA/QC Samples (per QAPP)				
Duplicates			10%	
Matrix Spike/Matrix Spike Duplicates			5%	
Trip Blanks			1 Per Batch	
Rinsate Blanks			1 Per Week*	

*Note: This is more frequent than QAPP.

Accurate tracking of sample collection and correlation of analytical data with soil stockpiles is critical for the execution of this project. Sample tracking and documentation will include the following:

- A systematic numbering methodology (with the prefix S9 to refer to this project) where each sample has a unique identification number (ID),
- Recording of all samples collected in the field notebook.
- Completion of a chain-of-custody for each sample set (and maintenance of sample chain-of-custody).
- Preparation of a site sketch, in the field, on the day of sample collection, annotated with sample locations and identification numbers.

Specific aspects of our sample locations as well as tracking and documentation for the different types of samples are discussed below.

7.1 Waste Stockpile Samples

Sections of the waste stockpiles will be numbered sequentially (P1 through P32). Further,

upon completion of a 500 cubic yard section of stockpile, water resistant placards will be placed at two locations along the slopes of the soil pile, underneath the poly sheeting used to cover the pile. In addition, a placard with the pile ID will be staked into the ground adjacent to the soil pile, outside the poly covering. The location of the soil stockpile and associated ID will be annotated on a site sketch maintained in the field.

Per the project specification and consistent with waste disposal facility criteria, Oak will collect a minimum of one 4-point composite per 500 cubic yards of waste. In general, two of the composite locations will be along the flanks of the pile and two will be on or near the crown of the pile (Figure 4). The approximate location of each sample used to generate a composite will be recorded in the field notebook. More than one composite sample per 500 cubic yards may be needed to meet disposal facility permit requirements. Each separate composite sample from a stockpile will be created from different sample locations on and within the pile. An example of the sample ID is as follows: S9-P1-1 (site ID – pile ID – sample number). The sample ID along with the field notes, annotated site sketches and pile placards will allow for accurate tracking of sample results with individual soil piles.

7.2 Backfill Samples

Each source of backfill materials will be given a unique ID, which will be recorded in the field notebook. Backfill will be certified clean fill based on direct chemical analyses of the materials being used for backfill. Samples collected at each source of backfill materials will be numbered sequentially. If more than one type of material is sampled at a given source, then the sample ID will reflect the material sampled (e.g., S9-Source1-sand1, S9-Source1-gravel1). A description of the sample location and/or a field sketch will be recorded in the field notebook.

7.3 Confirmatory Samples

The results of the confirmatory samples will be evaluated using both the Maine Remedial Action Guidelines for soils and EPA Region IX Preliminary Remediation Goals and Soil Screening Levels (Attachment C) as general guidelines. The goal of the ash and debris removal action is to show that the overall site-wide risk to human health and the environment is reduced to acceptable levels. To achieve this, the Navy intends to collect approximately ninety-six (96), discrete, grab samples as follows:

- Collect a set of two sidewall samples for every 32 linear feet of excavation wall;
  - one sidewall sample will be collected from varying depths ranging from 0 to 6 feet,
  - the second sidewall sample will be collected two feet above the excavation bottom,
- Collect a sample along the floor of the excavation for every 1,024 square feet (or a 32 foot square grid).
- Perform a post-excavation risk assessment to confirm that remaining soils do not pose an unacceptable risk, as necessary.

Sample locations will also factor in visual observations in the field (e.g., soil coloring, presence/absence of ash, soil type, etc...). The initial confirmatory sample locations, based on

the anticipated areas of excavation, are shown on Figure 4a, and represent the minimum number of samples to be collected. Additional samples may be collected based on excavation geometry, field observations, and laboratory results.

Confirmatory samples will be analyzed for the following parameters: VOCs via Method 8260, SVOCs via Method 8270, and total RCRA metals via Method 6010B. As noted previously, detection limits will be sufficiently low to determine whether soils remaining in place meet Maine DEP and EPA Region IX guidelines for cleanup. Each confirmatory sample will be a grab sample from a specific location. Additional excavation may be warranted based on initial results of confirmatory sampling. In this instance, additional confirmatory samples will be collected from newly excavated areas. The confirmatory sample results will be presented in a data package meeting EPA and Maine requirements for data validation and risk assessment, including all laboratory and field QA/QC samples.

Three types of information will be tracked for each confirmatory sample location: horizontal position, sample type (sidewall vs. bottom), and sample depth.

- To track horizontal position, a 32-foot grid will be established in the field. One axis will be parallel to Wyman Park and Avenue C and be given an alpha character, beginning with A. The second axis will be perpendicular to the first axis and be numbered, beginning with 1. The horizontal location will be then be assigned in the field based on this grid, using both an alpha and numeric character to identify a specific grid area (e.g., A5, D2). In addition, it is likely that there will be more than one sample per sample grid (at different depths). So, samples from the same sample grid will also be assigned a sequential number.
- The type of sample will be either an SW for sidewall or B for bottom sample.
- The approximate depth of the sample, in feet, will be recorded and used in the sample ID, immediately following the sample type. For example, the sample ID of S9-D2-SW4-1 will be the first sample from grid D2, from the sidewall at a depth of 4 feet.

The above information will be recorded in the field notebook, will be annotated on site sketches, and will be used throughout the sample labeling and chain-of-custody process.

-------- *End Section 7.0* --------

4. Please note that EPA New England uses Region 9 PRGs as risk based screening levels in the baseline Human Health Risk Assessment. If waste is left in place after this soil excavation that is above unrestricted use according to an EPA risk assessment, then a feasibility study must be performed to determine what additional remedial action will need to be performed. Therefore, detection limits must be low enough to determine if PRGs are exceeded.

   Response: *Region IX PRG's have been specifically identified in the Work Plan (Section 5.2 – shown below and Section 7.0 – provided in previous response) for purposes of both identifying necessary detection limits as well as applicable removal action objectives.*

Table from Section 5.2

Types of Samples	Data Quality Objectives / Required Detection Limits
Waste Stockpile Samples	Limits for defining characteristic hazardous wastes under RCRA Disposal facility permit limits
Confirmatory Samples	MEDEP Remedial Action Guidelines and EPA Region IX PRGs/SSLs
Backfill Samples	MEDEP Remedial Action Guidelines

5. Please edit the Work Plan text to describe the proposed confirmation samples based on depth. For example, rather than collecting one sidewall sample from an area that spans the depth of the excavation, samples should be collected as near surface samples (0 to2 feet), mid-depth samples (2 to 10 feet) and deep samples (below 10 feet) or some similar depth scheme per 100 square feet of sidewall. In addition at least one floor sample should be taken per 100 square feet and samples should be taken on all surfaces at near surface, mid-depth, and deep as the excavation may not be cubic. Please edit the Work Plan accordingly.

Response: *Section 7.0 includes a description of the approach and methodology for collection of confirmatory samples. In summary, confirmatory samples will consist of grab samples taken from the walls and floor of the excavation. The results of the confirmatory samples will be evaluated using both the Maine Remedial Action Guidelines for soils and EPA Region IX Preliminary Remediation Goals and Soil Screening Levels (Attachment C) as general guidelines. The goal of the ash and debris removal action is to show that the overall site-wide risk to human health and the environment is reduced to acceptable levels. To achieve this, the Navy intends to collect approximately ninety-six (96), discrete, grab samples as follows:*

- *Collect a set of two sidewall samples for every 32 linear feet of excavation wall;*
  - *one sidewall sample will be collected from varying depths ranging from 0 to 6 feet,*
  - *the second sidewall sample will be collected two feet above the excavation bottom,*
- *Collect a sample along the floor of the excavation for every 1,024 square feet (or a 32 foot square grid).*
- *Perform a post-excavation risk assessment to confirm that remaining soils do not pose an unacceptable risk, as necessary.*

The Navy intends to achieve cleanup standards for unrestricted use of the site; thus, discrete confirmatory sampling by depth is not necessary. For those areas of the excavation that will remain in place with concentrations exceeding risk-based standards, the Navy agrees that creation of separate data sets by depth would be necessary to accurately evaluate remaining risk scenarios.

6. The Work Plan presents no information related to entry and exit locations to the site and traffic flow patterns proposed at the site. The Site Safety and Health Plan (SSHP) did not identify the exclusion, contamination reduction, and safety zones proposed for the site. Although this is not a large complex site, this basic information should be provided. Figures containing this information should be added to the document.

Response: *The figures were inadvertently omitted from some copies of the draft workplan and SSHP. These figures have been provided (and are attached) and illustrate the items identified*

above. Figure 3 of the Work Plan shows the work area for the site as well as the support zone (e.g., safety zone), contaminant reduction zones, and the exclusion zone. Primary site access for personnel and hand equipment will be through the Support Zone. Large, driven equipment will be moved into the work area prior to the start of work and is expected to remain within the work area until the completion of the project. Trucks (or large equipment arriving once the project is underway) will enter/leave the site through the two truck washing pads located along Avenue C / Neptune Drive. Figure 7 of the Work Plan shows the traffic flow patterns for the site. Trucks will only be entering through Dyer Gate. However, trucks may leave via either Dyer Gate or the Main Gate; thus the flow patterns through Dyer Gate may be two-way, as shown.

7. All figures are missing from the Draft Work Plan and could not be reviewed.

Response: *See response to Item 6 above.*

8. The Work Plan does not clearly describe the sequence of operations related to excavated and stockpiled soil. Will there be only one stockpile from which characterization samples will be taken? If so, please describe how samples will be collected to get a representative characterization of the entire stockpile. If several stockpiles will be created, please clarify that in the Work Plan. If a time-distributed sequence of stockpiles will be created, sampled, and shipped, please edit the Work Plan to better describe that.

Response: *Additional information has been added on both the stockpile creation as well as waste characterization sampling. The following has been added to Section 6.0 – Method to Stockpile Soil:*

> *"Due to space limitations in the work area, waste stockpiles will be created in rows oriented north-south, parallel to Orion Street. Each row will be approximately 50 feet wide and 15 feet tall, with a cross-sectional area of approximately 525 square feet (or 58.3 square yards). Every 25 foot length of the row (8.3 yards) will delineate approximately 500 cubic yards of waste, and each section will be sampled separately so as to meet disposal facility requirements for off-site disposal. Actual field measurements will be used to delineate 500 cubic yard sections of each row. The work area has sufficient room for two or more rows of 200 feet in length; each row would represent approximately 4,000 cubic yards of waste."*

Figure 3 shows the locations of the waste stockpiles, and Figure 4 shows the sample locations for characterization of each 500 cubic yard section. In addition, the text in Section 7.1 – Waste Stockpile Samples (provided above) has been expanded to state that for each 500 cubic yard section of a row, a four-point composite sample will be collected, with two sample locations from along the flanks and two from at or near the top.

9. There is no mention of activities related to encountering groundwater or rainwater during the project. Please include. It is not appropriate to discharge treated wastewater from excavation dewatering and decontamination operations without having an analytical result confirming that the proposed treatment is adequate. Please provide the operational scheme to ensure that a representative analytical result is obtained prior to the discharge of treated wastewater.

Response: *A new section has been inserted into the Work Plan (Section 10) to specifically address water encountered in the excavation.*

10.0 HANDLING OF WATER IN EXCAVATION

Any water pumped from the excavation will be containerized (e.g., frac tanks). Specifically, Oak anticipates that two, 20,000 gallon frac tanks will be needed to handle the construction water. The water will be tested and disposed of in accordance with federal, state and base requirements. As noted in the workplan, EMI has been identified as an appropriately permitted transporter and disposal facility for liquid wastes. Based on the chemical quality of the water, the Navy may elect on-site treatment of the water using a combination of filters (e.g., particulate, carbon). If on-site treatment is performed, post-treatment chemical analyses of water will be performed prior to discharge. Any discharge of treated water will be coordinated with BNAS Water Resources, and treated water concentrations will meet MEDEP drinking water standards and/or other applicable standards (e.g., Maine Maximum Exposure Guidelines for discharges to the ground, and Ambient Water Quality Criteria for discharges to surface water bodies). Also, standard construction approaches will be used to minimize the quantities of water pumped from the excavation. This will include use of materials within the excavation to create temporary sumps and/or dams to control/contain excavation water and facilitate excavation activities.

---------- *End Section 10* ---------

10. Please ensure the Health and Safety Plan (HSP) will protect both the workers and the surrounding environment during the activities.

    Response: *The HSP and the Work Plan along with on-site Navy oversight result in the removal action being completed in a manner protective of workers, other on-base personnel, and the environment.*

11. There is no mention of dust monitoring. Please add.

    Response: *Dust monitoring has been added to the HSP.*

Dust		
Conduct monitoring for dust during any earth moving activity. Visible dusts will require dust suppression methods, such as water spray to reduce emissions.	Background to 0.5 mg/m	Modified Level D required.
	> 0.5 mg/m (i.e. visible levels)	Stop work and wet down source of dust emissions. Contact the PM for guidance if high dust levels persist. Prepare to upgrade to Level C protection.

12. Please ensure the sampling procedures for VOCs do not include compositing or homogenizing.

    Response: *Confirmatory samples of the excavation will be grab samples from discrete locations; hence, there will be no compositing for any of the analyses for confirmatory samples. In contrast, the soil stockpile samples for waste characterization are composite samples, as required by the disposal facilities.*

13. EPA suggests VOC cleanup levels be non-detect using the standard method 8260B analysis, as this site maybe the source area for VOC in groundwater. EPA suggests SVOC/metal/PCB/Pesticide cleanup levels be at or below R9 PRGs to ensure no soil restrictions need be maintained for this site.

    Response: *As noted in response to Item 5 above, the goal of the ash and debris removal action is to show that materials remaining upon completion of the removal action are below applicable cleanup standards. Both Maine Remediation Action Guidelines and EPA Region IX PRGs and Soil Screening Levels will be used for evaluation of confirmatory sample results. Both of these sets of guidelines include values for VOCs that are protective of groundwater.*

14. Please ensure that confirmation sampling data validation will be performed according to the *Region 1, EPA-New England Data Validation Functional Guidelines Evaluating Environmental Analyses*, July 1996, Revised December 1996. At a minimum, a Tier II data validation needs to be performed for all samples. Ten percent (10%) of the samples must have a Tier III validation if the results will be used in a risk assessment.

    Response: *The Navy will adhere to EPA requirements for final closeout of this site. Accordingly, the confirmatory sampling will include the necessary data to meet EPA requirements for data validation. As noted in Table 1 of Section 7.0 (provided above), 10% of the confirmatory samples will have a Level IV data package, which will allow for a Tier III validation.*

15. Please ensure the definable features of work include: 1) Construction of erosion control measures; 2) Identify and mark the area of the site to be excavated and the depth of the excavation required; 3) Construct soil stockpile(s); 4) split environmental monitoring into separate features for waste characterization, confirmation sampling and analysis, and air monitoring; and 5) split backfilling/restoration into the separate features of backfilling and site restoration. Other definable features may also be appropriate to facilitate proper inspection, quality control, and reporting for the work performed.

    Response: *The Navy contractor will provide daily, weekly and monthly reports on the activities completed, including documentation regarding the implementation of the removal action in a manner consistent with the approved Work Plan and Site Safety Plan. These reports will be organized by defineable work areas, as suggested in the comment above. In addition, the Navy will provide on-site oversight to ensure compliance with approved plans as well as base, state and federal regulatory requirements.*

END OF EPA COMMENTS OF JULY 25, 2005

Response to MEDEP Comments Dated September 13, 2005

The Maine Department of Environmental Protection (MEDEP) has reviewed the response to comments sent via email from Frank Cellucci on September 02, 2005. Based on that review MEDEP has the following outstanding comments and issues.

General Comments:

1. Please resubmit the Response to Comments (RTC) on the letterhead of the Navy or the contractor and addressed them to Christine Williams of EPA or Claudia Sait of MEDEP, as appropriate. The letter also needs to state that the RTC are being submitted on the behalf of the Navy and be signed by either the contractor or by you.

   Response: *The RTCs are provided as Appendix G to the Final Workplan. This provides a definitive correlation between the comments, the RTCs, the documents they address, and the party submitting the responses (e.g., the Navy).*

2. The final workplan must be submitted for review prior to initiating the work so that MEDEP can confirm that the approved revisions have been incorporated into the workplan.

   Response: *Agreed.*

3. Only one figure (Figure 4.a) has been submitted which depicts the proposed confirmation sampling locations. All of the figures need to be submitted for review by the agencies.

   Response: *All figures have been included in the Final Workplan and Health and Safety Plan.*

4. Please add an objective for the removal action. MEDEP suggests the following language: *"The objective of the removal action is to removal all ash and debris from the Site 9 Ash Landfill/Debris Dump as identified in the draft Direct Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report for Site 9 (EA 2004) and as depicted on Figure [INSERT NUMBER]. Confirmation sampling will be performed after all visible ash and debris has been removed to ensure that cleanup standards have been achieved for unrestricted used."*

   Response: *The text noted above has been inserted verbatim as the first paragraph in Section 2.0 – Statement of Work. The correct Figure reference is Figure "2" which has also been included..*

5. A table must be generated that combines the information in Table C and the new Table G (not submitted for review) so the regulators can compare the project action levels (i.e., Maine Maximum Exposure Guidelines (1992), Maximum Contaminant Level, Maine Remedial Action Guidelines and the Region IX PRGs/SSL) with the proposed detection limits and the reporting/quantitation limit. If the detection limit cannot be met then it must be noted (e.g vinyl chloride in groundwater). A cursory review of Table C indicates that not all the metals and compounds listed in the MEGs are included in the table and some of the listed ones are incorrect.

   Response: *The information from the Tables in Appendix G has been integrated into the Tables in Appendix C. Only those substances associated with the specified analytical methodologies for this project are listed; thus, some substances listed in the MEGs, MCLs, RAGs and PRGs/SSLs may not appear in Appendix C.*

RTC-3: It is unclear where the treated water will be discharged. Please clarify. Please keep in mind if the treated water is discharged to any surface water body it must meet the Ambient Water Quality Criteria (AWQCs), if it is discharged to the ground it must meet the Maine Maximum Exposure Guidelines (MEGs).

Response: *The Navy has not yet determined the most effective manor for dealing with the water that will be generated during this project. This will depend on the quantity and quality of water being generated. At present, the Work Plan indicates that the water may be taken off-site for disposal at an appropriately permitted facility, or that on-site treatment may be performed. The Navy agrees that, if on-site treatment is performed, discharges to surface water must meet AWQCs, and discharges to the ground must meet the MEGs. The text in Section 10 now reads as follows:*

> Any discharge of treated water will be coordinated with BNAS Water Resources, and treated water concentrations will meet MEDEP drinking water standards and/or other applicable standards (e.g., Maine Maximum Exposure Guidelines for discharges to the ground, and Ambient Water Quality Criteria for discharges to surface water bodies).

RTC 7: Please change the reference from the Maine Primary Drinking Water Standards to the MEGs. (Also see RTC 3 above regarding the AWQCs.)

Also regarding Table C-1, the following must be reviewed and revised as necessary. (Also see follow up comment 5 above.)

- Detection Limits must be much lower than the project action level. The reporting limit/quantitation limit should be one third the action level and the detection limit should be one third the report/quantitation limit.
- Please note that TPH cannot be used but the Diesel Range Organics and Gasoline Range Organics (Maine Health and Environmental Testing Laboratory Method 4.1.25 and Method 4.2.17 respectively) must be utilized.

Response: *All of the above changes have been incorporated into the Tables in Appendix C: The water samples include comparison to the Maine Maximum Exposure Guidelines (instead of the Maine Primary Drinking Water Standards); the Tables show both the Practical Quantitation Limits (PQLs) and the Method Detection Limits (MDLs), and references to TPH analyses have revised to refer to both the Maine DRO and GRO analyses (Methods 4.1.25 and 4.1.17, respectively).*

RTC 9 See follow up comment for RTC 3 above. Be sure to change TPH to DRO and GRO.

Response: *This change has been made.*

RTC 13: The objective for this removal action should be the removal of all visual ash and debris with confirmatory sampling of the sidewalls and underlying soils. (See follow up general comment 4 above.) MEDEP still recommends that VOC's in soils be remediated to non detect in order to expedite the natural attenuation of groundwater thereby reducing long term monitoring cost.

Response: *The Navy agrees with the objective for this removal action, as has been incorporated into the Work Plan per RTC 4 above. The Navy will also evaluate the cost-benefits of achieving non-detectable concentrations for VOCs in soils once confirmatory sampling data become available. Please note that the Navy expects to encounter few and low concentrations of VOCs in the materials being removed, if they are detected at all.*

END OF MEDEP COMMENTS DATED SEPTEMBER 13, 2005

Response to Navy Comments Dated July 14, 2005

1. The plan does not adequately address what is going to be done with any contaminated water. The plan will also need to address disposal of any wash water used for the decontamination of equipment and/or personnel. Please be sure the contractor understands that NOTHING IS TO BE PUT INTO THE STORM DRAINS!!!! No water is to be disposed of in the sanitary sewer WITHOUT approval of this office.

Response: *A new section has been inserted into the Work Plan (Section 10) to specifically address water encountered in the excavation.*

10.0 HANDLING OF WATER IN EXCAVATION

Any water pumped from the excavation will be containerized (e.g., frac tanks). Specifically, Oak anticipates that two, 20,000 gallon frac tanks will be needed to handle the construction water. The water will be tested and disposed of in accordance with federal, state and base requirements. As noted in the workplan, EMI has been identified as an appropriately permitted transporter and disposal facility for liquid wastes. Based on the chemical quality of the water, the Navy may elect on-site treatment of the water using a combination of filters (e.g., particulate, carbon). If on-site treatment is performed, post-treatment chemical analyses of water will be performed prior to discharge. Any discharge of treated water will be coordinated with BNAS Water Resources, and treated water concentrations will meet MEDEP drinking water standards and/or other applicable standards (e.g., Maine Maximum Exposure Guidelines for discharges to the ground, and Ambient Water Quality Criteria for discharges to surface water bodies). Also, standard construction approaches will be used to minimize the quantities of water pumped from the excavation. This will include use of materials in the excavation to create temporary sumps and/or dams to control/contain excavation water and facilitate excavation activities.

---- End Section 10.0 ------

2. The erosion and sediment control plan looks good. However, we will need a site map indicating were the silt fence, hay bales, etc.. are going to be placed.

Response: *Erosion controls will be placed around the perimeter of the work area, as shown on Figure 3 of the Work Plan.*

3. ROICC contact info indicates Joe Gallant versus Jim Toal at [207] 921-2315.

Response: *The Work Plan has been revised accordingly.*

"Resident Officer in Charge of Construction (ROICC)
NAS, Brunswick, Maine
Jim Toal at [207] 921-2315"

4. Spill response section - For any spill more than 2 gallons, the contractor must call [207] 921-3333 to notify the Fire Dept who will assume on-site control of all spill containment and control measures. The contractor will assist as directed by the BNAS Fire Dept.

Response: *The Work Plan has been revised accordingly.*

> "For any spill more than 2 gallons, on-site personnel will call [207] 921-3333 to notify the Fire Department who will assume on-site control of all spill containment and control measures. The Oak Team will assist as directed by the BNAS Fire Department."

5. Use debris covers on all over-the-road trucks removing or importing soil to the site.

Response: *The Work Plan has been revised to include the following:*

> "Oak will ensure that all vehicles used for T&D are equipped with appropriate appurtenances (e.g. tarps) in acceptable working condition. All loads must be covered prior to departure. Liners will be used if vehicle beds do not properly seal when closed."

6. Waste disposal - Documentation [manifests] for hazardous waste departing the air station must be signed by the Base coordinator, Dale Mosher, [207] 921-2702 before leaving the Base and a copy of the manifest presented to the ROICC.

Response: *The Work Plan has been revised to include this information verbatim.*

7. No details are shown indicating placement of the stockpiles, erosion control measures, vehicle and personnel decons and general vehicle access ways and any traffic control measures that may be necessary.

Response: *The figures were inadvertently omitted from some copies of the draft workplan. These figures illustrate the items identified above.*

In the HASP section:

8. ROICC contact information should be Jim Toal versus Joe Gallant.

Response: *The HASP has been revised accordingly.*

Resident Officer in Charge of Construction (ROICC)
NAS, Brunswick, Maine
James Toal – (207) 921-2315

9. The air station emergency response number to report accidents, fires, spills is [207] 921-3333, not 2309.

Response: *The HASP has been revised accordingly.*

EMERGENCY PHONE NUMBERS *(Contact project manager following any emergency)*

Rescue	BNAS Emergency Dispatch
Fire	(207) 921-3333
Police	

10. As noted to Mr. Newman via separate email today, another HASP is required showing general safety items, excavation safety, access, dewatering, etc..

Response: *The HASP has been expanded to include detailed information on safe excavation procedures (especially as it relates to slope stability), equipment safety, utility line abandonment, and use of small tools. These procedures are expected to encompass the general safety items required for this removal action (and are attached). Regarding site access, Figure 3 of the Work Plan shows the access to the work area. In addition, the following has been added to Section 7.1 – Work Zone:*

> *"Access to the work zone will be restricted by temporary fencing that surrounds the work zone, with the limited access points shown on Figure 3. Potential visitors to the site will be directed to the Support Zone where "Visitor" procedures will be implemented, as outlined on the Visitor Guideline sheet in this plan. Visitors will be allowed access to the Work Area where it is determined that they have a direct role in the project or the chain-of-command for the project. Oak Team personnel will be reminded during daily safety briefings to be aware of possible unannounced visitors to the site. Oak Team personnel will be directed to immediately contact the Site Safety Officer via 2-way radio if unescorted visitors are observed in the Work Area or at access points to the Work Area. The Site Safety Officer will then initiate direct contact with the (potential) visitor and institute Visitor Guidelines."*

11. In the work plan you state a HASP will be submitted under a separate cover for general site safety. Your submittal has a HASP section, but those items addressed pertain to environmental issues and actions only. Will you still submit another HASP and hazard analysis to address general safety, excavation, mechanical equipment, access and dewatering, etc?

Response: *See response to Item 10 above.*

SITE SAFETY AND HEALTH PLAN (SSHP)

Site 9 Ash Landfill/Dump Removal Action
NAS Brunswick, ME

N62472-05-Q-SB22

Submitted to:

NAVAL FACILITIES ENGINEERING COMMAND
EFA NORTHEAST
10 INDUSTRIAL HIGHWAY

Submitted By:

oak environmental consultants, Inc.
Greentree Mews
800 North Route 73, Suite 12
Marlton, NJ 08053

Reviewed By: Eduard J. Eichen
Eduard J. Eichen, CIH

Date: October 17, 2005

Project Contact List

Engineering Field Activity Northeast (EFANE)
10 Industrial HWY., MSC #82
Lester, PA 19113-2090
Code EV4/CG
ATTN: Mr. Claude Graff, Contract Specialist
(610) 595-0631

Engineering Field Activity Northeast (EFANE)
10 Industrial HWY., MSC #82
Lester, PA 19113-2090
Code EV4/FJC
ATTN: Frank Cellucci, Project Lead (PL)
(610) 595-0567, x122

Engineering Field Activity Northeast
10 Industrial HWY., MSC #82
Lester, PA 19113-2090
Code 182/LM
ATTN: Mr. Lonnie J. Monaco, P.E., Remedial Project Manager (RPM)

Resident Officer in Charge of Construction (ROICC)
Naval Air Station
437 Huey Drive
Brunswick, ME 04011-5000
ATTN: Jim Toal
(207) 921-2315

Naval Air Station, Environmental Office
437 Huey Drive
Brunswick, ME 04011-5000
ATTN: Ms. Lisa Joy
(207) 921-1717

Ms. Claudia B. Sait
Division of Remediation
Bureau of Remediation & Waste Management
Maine Department of Environmental Protection
17 State House, Station
Augusta, ME 04333
(207) 287-7713

Ms. Christine Williams
EPA - New England (Region 1)
1 Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023
(617) 918-1384

Ms. Carolyn Lepage
Lepage Environmental Services, Inc.
731 Hotel Road (FedEx)
Auburn, ME 04210
(207) 777-1049

P.O. Box 1195 (Regular Mail)
Auburn, ME 04211-1195

SITE EMERGENCY FORM

Contaminants of Concern: **Petroleum, Heavy Metals, PAHs, Potential VOCs**
Minimum Level of Protection: **Level D**

Do not endanger your own life. Survey the situation before taking any action.

Oak Team Field Mobile Telephone	(401) 230-8718
Site Location Address	Wyman Park/Avenue C Brunswick NAS, Brunswick, ME
Telephones Located On-Site	Superintendent Mobile Telephone

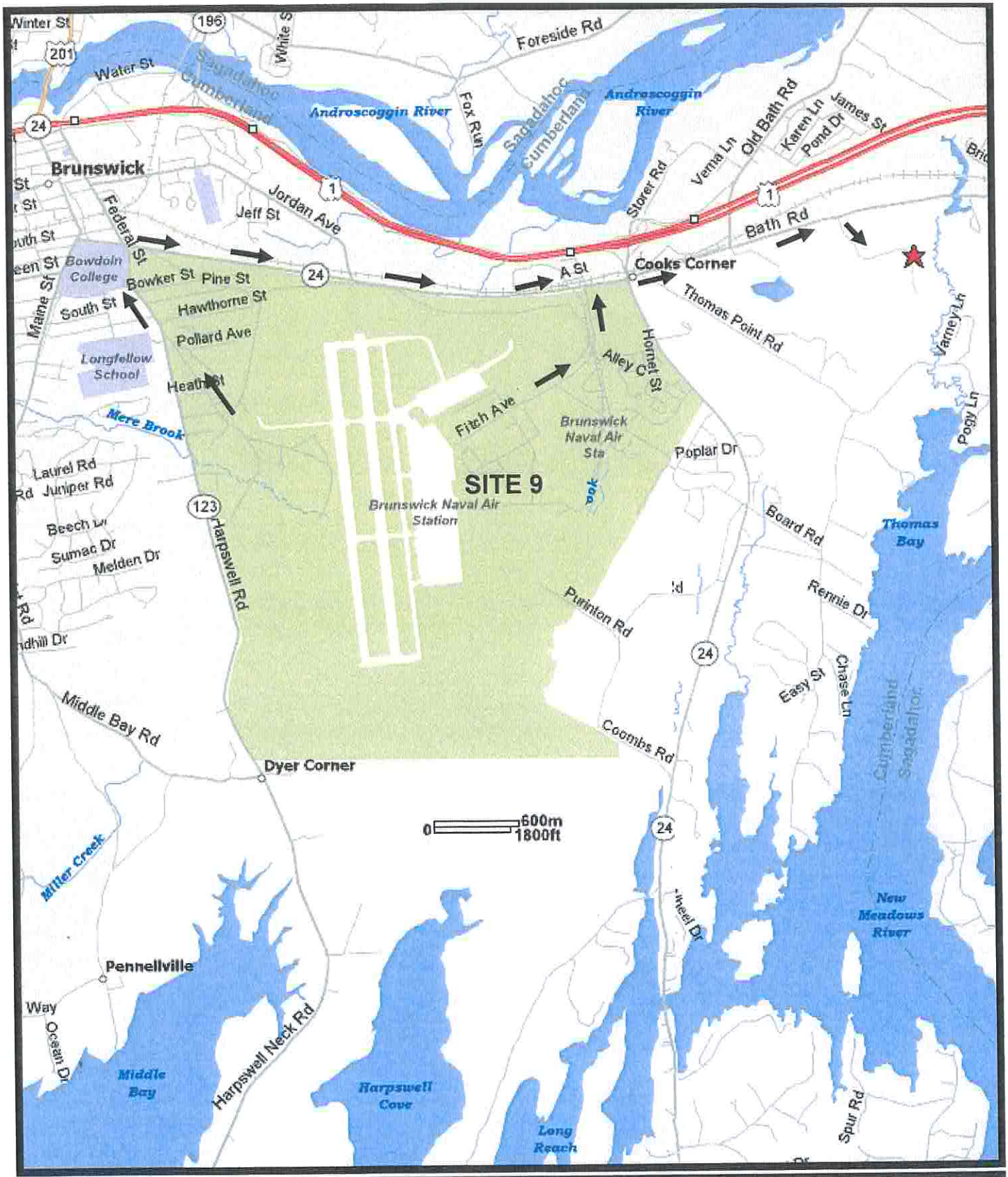
EMERGENCY PHONE NUMBERS *(Contact project manager following any emergency)*

Rescue	BNAS Emergency Dispatch (207) 921-3333
Fire	
Police	
Hospital Name	Mid Coast Hospital
Hospital Phone Number	(207) 729-0181
Project Manager (PM)	Bruce Newman (609) 923-2563
Site Safety and Health Officer (SSHO)	Mike Rose (401) 230-8718
Navy PM	James Toal – (207) 921-2315
Navy ROICC	James Toal – (207) 921-2315

UTILITY MARKER EMERGENCY TELEPHONE NUMBERS

Utility	Color Code	Telephone Number
Water Gas Electric Telephone/Cable Sewer	Blue Yellow Red Orange Green	Dig Safe Telephone Number 1-888-344-7233 BNAS Utilities – James Toal (207) 921-2315 BNAS Utilities Foreman – Ron Coculo (207) 921-1706

HOSPITAL LOCATION MAP	
See Figure 1 on following page.	
HOSPITAL DIRECTIONS: **Via Dyer's Gate:** Right on Harpswell Road; Right on Bath Road, Go 2.3 miles, Right on Medical Center Drive, Go 0.5 miles Via Main Gate: Left on Gurnet Road; Right on Bath Road, Go 0.9 miles, Right on Medical Center Drive, Go 0.5 miles Total Estimated Time: 10 minutes Total Estimated Distance: 4 to 8 miles	**HOSPITAL INFORMATION:** Name: Mid Coast Hospital Address: 123 Medical Center Drive City, State: Brunswick, ME 04011 Phone General: (207) 729-0181



NAVAL AIR STATION BRUNSWICK, MAINE	
	Figure 1 - HOSPITAL ROUTES
	Source: HOSPITAL_ROUTES.ppt

AGREEMENT AND ACKNOWLEDEMENT SHEET

The Oak Project Team has the authority to stop field activities at this site if any activity is not performed in accordance with the requirements of the HASP. All project personnel, subcontractor personnel, and personnel in the work area are required to sign the Agreement and Acknowledgment Sheet **prior** to conducting field activities at this site.

AGREEMENT AND ACKNOWLEDGMENT STATEMENT		
1. I have read and fully understand this HASP and my responsibilities. **2. I agree to abide by the provisions of this HASP.**		
Name and Company	Signature	Date

VISITOR GUIDELINES

The Oak Project Team is committed to providing a safe environment on all work sites for visitors, trainees, employees and/or passersby. In order to accomplish this, the following guidelines must be followed. **Infractions of the listed requirements agreement will be viewed as extremely serious and will be subject to discipline up to and including termination for either the trainee and/or supervisor.**

Any person not actively participating in the work at the site is regarded as a "visitor" and must follow the visitor/trainee guidelines while on-site. Visitors must be accompanied by a representative at all times.

Visitors will attend and sign-off on a site orientation. The orientation will cover specific areas that visitors will not be allowed to access during certain work activity. Visitors are required to wear appropriate PPE on-site. Required PPE for visitors include:

- closed toed shoes,
- hard hat,
- safety glasses with side shields,
- proper footwear, and
- other as required by SHSO (i.e., gloves, hearing protection, etc.)

I agree to adhere to the above conditions in all instances while on-site as a trainee/observer.

Visitor Signature	Visitor Name (Print)	Date	On-Site Escort

HASP AMENDMENT SHEET

Project Name: Site 9 Removal Action, Brunswick NAS, Brunswick, ME

Project Number: N62472-05-Q-SB22

PM:

Location:

Changes in field activities or hazards:

Approved by:_____ _____
Project Manager Date

Approved by:_____ _____
Health and Safety Representative Date

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LIST OF FIGURES

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Figure 2 – Site 9 Work Areas

APPENDICES

APPENDIX A – SOIL AND GROUNDWATER DATA, SITE 9 DELINEATION REPORT

APPENDIX B – MATERIAL SAFETY DATA SHEETS

- Fly Ash
- Gasoline
- Diesel
- Trichloroethylene (TCE)
- Trans-1,2-Dichloroethylene (DCE)
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APPENDIX C – ON-SITE WORKER OSHA CERTIFICATIONS
(to be constructed as workers are assigned to the project and arrive on-site)

APPENDIX D – CONSTRUCTION STANDARD OPERATING PROCEDURES
(from Corporate Safety Manual)

- Section 9-5 – Demo/Line Breaking Procedure
- Section 9-7 – Excavation
- Section 9-15 – Mobile Equipment Safety
- Section 9-21 – Tool Safety

LIST OF ACRONYNMS

ACGIH	American Conference of Governmental Industrial Hygienists
BNAS	Brunswick Naval Air Station
CFR	Code of Federal Regulations
CGI	Combustible gas indicator
IDLH	Immediately dangerous to life or health
LEL	Lower explosive limit
Mg/kg	Milligrams per kilogram
mg/M_3	Milligrams per cubic meter
MSDS	Material Safety Data Sheet
O_2	Oxygen
OSHA	Occupational Safety and Health Administration
PEL	Permissible exposure limit
PID	Photoionization detector
PM	Project Manager
PPE	Personal protective equipment
ppm	Parts per million
SHSO	Site Health and Safety Officer
TLV	Threshold limit value

1.0 SITE DESCRIPTION

NAS Brunswick is an active base, owned and operated by the Federal government through the Department of the Navy. NAS Brunswick is located in Brunswick, Cumberland County, Maine, south of the Androscoggin River and south of Route 1 between Routes 24 and 123.

Site 9 is approximately 20 acres in area and is located in the central portion of the base. The CERCLA Information System operable unit number assigned to Site 9 is OU6. Records indicate that a former incinerator, ash landfill/dump area, and disposal area are located at Site 9. The incinerator was reportedly used from April 1943 until the Fall of 1946, but may have been used as late as 1953 when the barracks buildings were constructed. Solid wastes were incinerated and the ash was disposed of in the dump (now referred to as the ash landfill/dump area), and other wastes disposed of into the dump reportedly included solvents which were burned on the ground, paint sludge, and possibly wastes from the metal shop (U.S. Navy 1994 [PRAP]).

Site 9 has been characterized in the Draft Final Direct-Push Groundwater and Ash Landfill/Dump Area Delineation Investigation Summary Report For Site 9, Naval Air Station Brunswick, Maine of November 2004. Tables 2 and 3 of the Delineation report are provided as Attachment A. The results of the chemical analyses indicated the following:

Soils

- There were few VOCs detected.
- The following petroleum compound was detected: naphthalene at 1.6 mg/kg.
- A variety of PAHs were detected; the maximum concentration was pyrene at 7.3 mg/kg.
- Metals were detected; notable concentrations include chromium at 87 mg/kg, lead at 1,440 mg/kg, mercury at 0.17 mg/kg and zinc at 3,500 mg/kg.

Groundwater

- Vinyl chloride and trichloroethene (TCE) were the only VOCs detected above regulatory standards at a concentrations of 7.1 and 7.3 ug/L, respectively.

1.1 Location

Brunswick NAS is located south of Route 1 and is bounded approximately by Bath Road to the north, Harpswell Road to the west, and Gurnet Road to the east. The Site 9 project area is located in the east central part of the base along Orion Street, between Avenue C and Wyman Park. The location of the site is shown in the emergency information at the beginning of this HASP.

1.2 Surrounding Population

The nearest regularly occupied buildings are north of Wyman Park and south of Avenue C. Both of these areas are within several hundred feet of the project area. A parking area is adjacent to the site to the east, and Orion Street borders the site to the west.

1.3 Topography and Accessibility

The site is a flat, open area. Accessibility to Brunswick NAS is controlled by the Navy via security gates. Once on base, the project area is accessible via the adjacent streets.

1.4 Site History

A former incinerator was located near the project site. Ash from that incinerator was buried; this ash constitutes the material targeted for the removal action.

1.5 Planned Duration of Site Activity

The site work will be completed within a 90-day period, as part of a single mobilization. A schedule for site activities is included in the workplan. The excavation of soils and ash is expected to take place over a four to five week period.

1.6 Anticipated Weather Conditions During Site Activity

Work will be completed in the months of July through October. Summer weather is expected which could mean high heat and humidity. Also, sudden thunderstorms are a possibility.

1.7 Will this Job Involve "Confined Space" Work ?

Yes____ No **X**

If Yes, explain_____

_____

1.8 Are Utility Notifications Needed for Subsurface Work? Yes X No

DIGSAFE will be contacted prior to beginning any subsurface excavations. In addition, BNAS utility personnel will be contacted regarding the presence of utilities in the work area. The demolition activities call for removal of water and sewer lines. These lines should already by disabled. This will be confirmed prior to the start of demolition activities.

Utility clearances provided by DIGSAFE and BNAS will be recorded in the field notes and presented in the daily reports.

2.0 PROJECT OBJECTIVES

The specific tasks to be completed by this project and to be covered by this HASP are as follows:

- Establish erosion controls for the site
- Clear vegetation from the work area
- Removal of concrete slabs and foundations
- Removal of water and sewer utilities and capping of lines
- Setup of decontamination area and soil staging area
- Stripping of topsoil
- Excavation of soil and screening of any debris
- Air monitoring
- Placement of soils in staging area
- Collection of waste characterization samples
- Loading of soil and debris for off-site disposal
- Equipment decontamination
- Backfilling
- Site restoration

3.0 ON-SITE ORGANIZATION

Team Leader and Site Safety Officer – Mike Rose.

Mr. Rose is responsible for all aspects of implementing this HASP, including compliance by all on-site personnel and subcontractors. Mr. Rose may designate an appropriately trained and qualified person to assume his role as the on-site team leader and/or the SSHO responsibilities on a day-to-day basis.

All on-site personnel have authority to stop work should unsafe conditions arise. Personnel identifying unsafe or potentially unsafe conditions have a responsibility to report those conditions to the SSHO immediately.

All Oak team personnel as well as subcontractor personnel present on-site during excavation of the debris and/or involved in handling of the debris will have appropriate and current 40-hour OSHA training per 29 CFR 1910.120. The SSHO will attach to the back of this HASP the training certificates for on-site personnel collected either prior to their mobilization to the site or upon arrival at the site.

Should site conditions arise requiring a modification to the HASP, Mr. Rose will coordinate with Dave Egan, Safety Officer, to ensure that any modifications are fully protective of worker health and safety.

4.0 HAZARD ANALYSES

4.1 Potential Chemical Hazards Present at the Site

Chemicals of concern that are known to be present in the soil at the Site and their potential health effects are summarized below. Note that the average concentrations of these substances detected at the site are low relative to EPA Region IX Preliminary Remediation Goals for soils at industrial sites.

Compound	Published Exposure Limit	Exposure Symptoms	Target Organs
Naphthalene			
Pyrene			
Chromium	OSHA PEL = 1mg/m^3 ACGIH TLV = 0.5 mg/m^3 IDLH = none given	Headache, coughing, shortness of breathe, dermatitis,	Respiratory system
Mercury			
Lead	OSHA PEL = 0.05mg/m^3 TLV = 0.05 mg/m^3 IDLH = 100 mg/m^3	weakness, lassitude (weakness, exhaustion), insomnia, irritation eyes; hypotension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue
Zinc			
Dioxin			
PCBs	OSHA PEL = 0.5 mg/m^3 TLV = 0.5 mg/m^3 IDLH = 5 mg/m^3	Irritation of skin and eyes, contact dermatitis and chloracne. Routes of exposure include absorption and inhalation. Carcinogen.	Skin, liver and reproductive system

Compound	Published Exposure Limit	Exposure Symptoms	Target Organs

PEL – Permissible Exposure Limits. Time weighted averages (unless otherwise noted) that must not be exceeded during any eight-hour work shift of a 40-hour workweek. The PELs were obtained from OSHA 29 CFR 1910, July 1, 1991.

TLV – Threshold Limit Value. The time weighted average concentration (unless otherwise noted) for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. The TLVs were obtained from the "1992-1993 Threshold Limit Values and Biological Exposure Indices", by the American Conference of Governmental and Industrial Hygienists.

IDLH- Immediately Dangerous to Life or Health Concentrations. IDLHs represent the maximum concentration from which, in the event of respiratory failure, one could escape within 30 minutes without a respirator and without experiencing any escape impairing (e.g., severe eye irritation) or irreversible health effects.

Note: Other contaminants such as polycyclic hydrocarbons may be present in environmental media on-site, but levels are low enough that they should not pose a health hazard to workers providing specified PPE is worn.

4.2 Chemical Hazards Associated with Equipment/Tools

This project requires motorized equipment that uses gasoline, diesel, oil and hydraulic fluids. Material Safety Data Sheets for these substances are provided in Attachment B. Spill control equipment will be present at the site should any of these materials leak or be released to the ground. There are no other chemicals that will be needed to complete this project.

4.3 Identify Unique Chemical Characteristics (e.g. odor, warning properties):

The ash is expected to have a distinctive color and texture from the surrounding soils and be identifiable based on visual evidence. The presence of petroleum hydrocarbons may be evident visually through the appearance of sheens on oils or on water in the excavation. Petroleum odors may also appear, although petroleum odors from the equipment on-site may mask odors from petroleum in the soils.

4.4 List of Potential Physical Hazards and Controls

- Underground Utilities – A utility clearance via DigSafe and BNAS personnel will be conducted prior to initiating site activities. Site personnel will be alerted to the possible presence of unmarked underground utilities and will stay alert for their possible presence when disturbing the upper few feet of soils. Overhead utilities are not an issue at the site. Procedures for demolition and capping of the utilities to be abandoned as part of this project are provided in Appendix D.

- Heat Stress – The SSHO will ensure that appropriate breaks are taken throughout the workday to avoid heat exhaustion. Water will be provided for all on-site workers including electrolyte-based drink mixes.

- Noise – On-site workers will wear hearing protection when on-site equipment is in operation. Hearing protection will be provided on-site.

- Heavy Equipment – Trucks, excavators, loaders and related heavy equipment will be used. All equipment will be equipped with appropriate alarms and warning lights. All equipment will be operated by experienced, licensed operators. The site superintendent will coordinate workers so that on-site personnel are not endangered by the movement of equipment around the site. Daily tailgate meetings will address the planned heavy equipment operations for the day. Procedures for inspection and operation of heavy equipment are provided in Appendix D.

- Excavation – Soil excavation along the embankment may result in temporary slope failures. Personnel will not be allowed to stand or work in areas of potential slope collapse. OSHA standards for temporary excavations will be used to ensure a safe work area. The excavation will be backfilled as quickly as possible to minimize the potential for slope failures. Procedures to ensure safe excavation, including slope stability, are provided in Appendix D.

- Power Tools – Hand tools such as power saws may be used during utility line demolition and capping. Each worker assigned to use a power tool will be familiar with the operation of the equipment, as verified by the SSHO, prior to starting an assigned task. Procedures for proper operation of hand tools are provided in Appendix D.

5.0 AIR MONITORING

The SSHO will direct periodic monitoring at the site when the following occurs:

1. It is possible that an immediately dangerous to life or health (IDLH) conditions or a flammable atmosphere has developed, or

2. There is an indication that exposures may have risen over established action levels, permissible exposure limits or published exposure levels since the last monitoring. Look for a possible rise in exposures associated with these situations:
   - Change in site area - work begins on a different section of the site.
   - Change in contaminants - handling contaminants other than those first identified.
   - Visible signs of particulate exposure from intrusive activities such as excavation.
   - Perceptible chemical odors or symptoms of exposure.
   - Change in on-site activity - one operation ends and another begins.
   - Handling contaminated materials.
   - Working with obvious liquid contamination (e.g., a spill or lagoon).

Air Monitoring Action Levels

Instrument*	Function	Measurement	Action
Photoionization Detector (PID)- Measures Total Organic Vapors (TOC)			
Conduct air monitoring for volatile organic compounds during activities where contaminated media are present.		Background	Modified Level D.
		>Background - 5 ppm	Modified Level D. Continue monitoring – check worker breathing zones.
		>5 ppm - 20 ppm	Modified Level D. Check worker breathing zones and identify source of vapors, if possible.
		>20 ppm	Stop work and contact the PM for guidance. Prepare to upgrade to Level C/B protection.
		LEL > 10%	Leave area immediately. Contact PM for guidance on venting and other safety measures.
Dust			
Conduct monitoring for dust during any earth moving activity. Visible dusts will require dust suppression methods, such as water spray to reduce emissions.		Background to 0.5 mg/m	Modified Level D required.
		> 0.5 mg/m (i.e. visible levels)	Stop work and wet down source of dust emissions. Contact the PM for guidance if high dust levels persist. Prepare to upgrade to Level C protection.

6.0 PERSONAL PROTECTIVE EQUIPMENT

This section lists the minimum requirements for each protection level. All work at the site is expected to be completed in Level D or modified Level D. Should air monitoring results indicate that Level C protection is required, work will be halted at the site until the specific nature of the hazard is determined. Further, this HASP will be augmented with information regarding the conditions requiring an upgrade in personal protection and associated procedures for working in Level C.

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Work clothing as prescribed by weather
- Leather work gloves when handling materials or hand tools

Modified Level D consists of one or more of the following in addition to Level D:

- Hearing protection
- Nitrile, neoprene, PVC, or latex booties
- Outer nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)
- Tyvek coverall [poly-coated tyvek for handling liquids and exposure to splashes.]

Level C consists of the following:

- Full-face, air-purifying respirator with appropriate cartridges
- Hooded Tyvek coveralls [poly-coated tyvek for handling liquids and exposure to splashes.]
- Hard hat
- Steel-toed work boots
- Nitrile, neoprene, or latex overboots
- Nitrile, neoprene, or PVC gloves over latex sample gloves
- Face shield (when projectiles or splashes pose a hazard)

7.0 SITE CONTROLS

7.1 Work Zones

The primary work zone will be delineated by the erosion controls put in place at the beginning of the project around the debris area. Orange fencing will be used to augment the erosion controls to create a visual barrier around the work area, as needed.

Access to the work zone will be restricted by temporary fencing that surrounds the work zone, with the limited access points shown on Figure 2. Potential visitors to the site will be directed to the Support Zone where "Visitor" procedures will be implemented, as outlined on the Visitor Guideline sheet in this plan. Visitors will be allowed access to the Work Area where it is determined that they have a direct role in the project or the chain-of-command for the project. Oak Team personnel will be reminded during daily safety briefings to be aware of possible unannounced visitors to the site. Oak Team personnel will be directed to immediately contact the Site Safety Officer via 2-way radio if unescorted visitors are observed in the Work Area or at access points to the Work Area. The Site Safety Officer will then initiate direct contact with the (potential) visitor and institute Visitor Guidelines.

The decontamination pad will be set up adjacent to and on the northern boundary of the work zone. The soil stockpile area will be established in close proximity to the excavation area, to the west. The only activities associated with the soil stockpile area will be creating the stockpiles and covering them with plastic, stockpile sampling, and material loadout for off-site disposal.

Procedures will be used to prevent vehicle tracking of potentially contaminated materials away from the work zone. Equipment leaving the work zone will be decontaminated. Personnel washing stations will also be established in the decontamination zone. Visitors will not be allowed in the work zone unless accompanied by project personnel and it is determined to be safe by the SSHO.

The erosion controls around the work area are expected to provide adequate warning to passersby of the potential areas of excavation left open at the end of a work day. As necessary, the Oak project team can upgrade the markings at the site to include orange snow fencing to alert passersby to the potential hazard and/or place flashing lights.

7.2 Site Communications

Mobile telephones will be the primary means of communication at the site. Based on site reconnaissance, mobile telephone reception and transmission is adequate in the area of the site. The project manager, site superintendent and SSHO, at a minimum, will have mobile telephones. Their contact numbers are provided on the emergency contact cover sheet to this HASP.

7.3 Work Practices

The site superintendent will establish safe work practices throughout the project. As necessary, the project manager will provide written standard operating procedures to address recurring safety concerns. The site superintendent will conduct daily tailgate briefings prior to the beginning of work each day to emphasize SAFETY FIRST.

8.0 TRAINING

Site personnel entering work zones during soil excavation and material handling activities must have current 40-hour OSHA training per 29 CFR 1910.120. Copies of certificates showing proof of training must be provided to the SSHO prior to personnel initiating work at the site. In addition, Mike Rose, the site superintendent, has completed the OSHA 8-hour supervisory training. Mr. Rose's certificates of OSHA training are attached to this HASP.

9.0 DECONTAMINATION

Decontamination will be performed with soap and water. Equipment will be cleaned with a pressure washer / steam cleaner. A detergent will be added to the equipment decontamination process if there is visible evidence of staining or discoloration of the equipment from site contaminants.

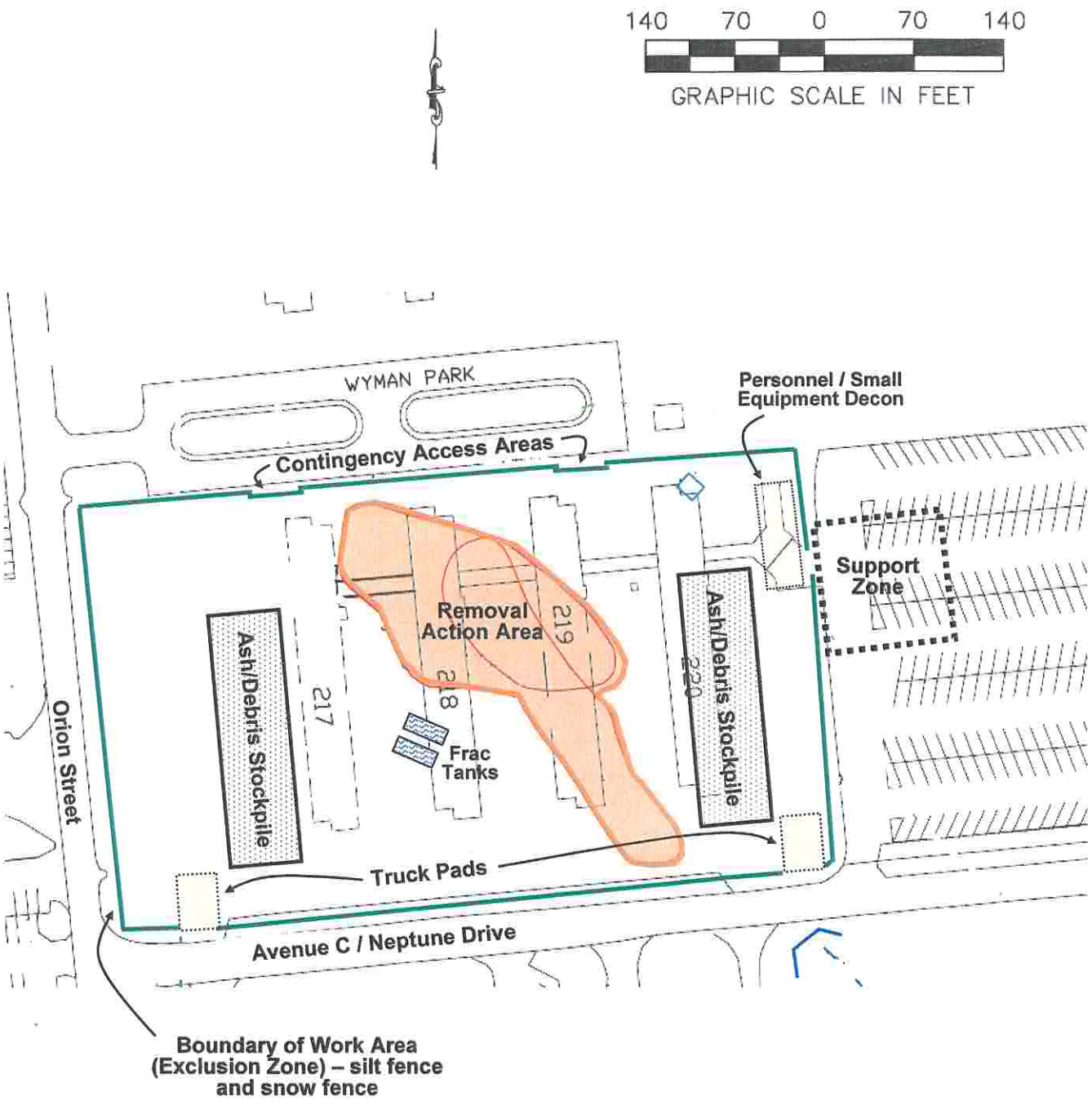
Personnel decontamination will include a variety of steps. Disposal boots and gloves will be used. These materials will be doffed by site personnel in the decontamination area; trash receptacles will be designated for disposal of PPE. Personnel with clothing or equipment that can be decontaminated will undergo a wash and rinse in the decontamination area until there are no visible signs of contamination. Skin surfaces, including hands and faces, will be washed in the decontamination area with soap and water.

All decontamination water will be containerized for off-site disposal. The work plan presents more detailed information on the decontamination pad for the site.

10.0 MEDICAL MONITORING PROGRAM

Project team employees performing field activities participate in the corporate medical monitoring program. This program includes periodic medical exams by an Occupational Physician, per OSHA guidelines for workers at hazardous waste sites. The program includes a baseline exam, periodic exams (up to annually for personnel regularly in the field), and a final physical upon leaving the relevant employment.

The medical monitoring program includes a determination that workers are in satisfactory physical health to wear respiratory protection.



Note: Support Zone will be located in area of parking lot designated by BNAS for electrical hookup.

NAVAL AIR STATION BRUNSWICK, MAINE	PROJECT DESCRIPTION
	Figure 2: SITE 9 WORK AREAS
	Source: USGS

TABLE 3 SUMMARY OF ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED FROM 27 TO 30 MAY 2003 AT THE ASH LANDFILL/DUMP AREA ASSOCIATED BARRACKS BUILDINGS 218 AND 219

	Sample ID													
	S9-ASH-SB-2 8-16 ft bgs		S9-ASH-SB-2 8-16 ft bgs Duplicate		S9-ASH-SB-5 10-11 bgs		S9-ASH-SB-5 14-15 bgs		S9-ASH-SB-16 15-16 bgs		S9-ASH-SB 22 16-17 bgs		S9-ASH-SB 26 10-11 bgs	
	Preservative		Preservative		Preservative		Preservative		Preservative		Preservative		Preservative	
Analyte	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$
VOLATILE ORGANIC COMPOUNDS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 5035/8260B (µg/Kg)														
Vinyl Chloride	15	NA	4J	NA	(<12U)	(<13U)	(<12U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<11U)	(<11U)
Carbon Disulfide	(<5U)	NA	(<5U)	NA	(<6U)	(<6U)	3J	12	(<5U)	(<5U)	(<5U)	3J	(<5U)	(<5U)
Methylene Chloride	15B	NA	13B	NA	11	(<6U)	7	(<5U)	6	(<5U)	5B	(<5U)	(<5U)	(<5U)
Acetone	67B	NA	68B	NA	31	28	160	19J	53	(<20U)	67B	(<20U)	(<22U)	(<21U)
cis-1,2-Dichloroethene	4J	NA	(<5U)	NA	(<6U)	(<6U)	(<6U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
1,2-Dichloroethene (total)	4J	NA	(<10U)	NA	(<12U)	(<13U)	(<12U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<11U)	(<11U)
Toluene	(<5U)	NA	(<5U)	NA	(<6U)	(<6U)	(<6U)	4J	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
SEMIVOLATILE ORGANIC COMPOUNDS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8270C (µg/Kg)														
Naphthalene	40J	NR	(<810U)	NR	160J	NR	(<410U)	NR	1,600	NR	330J	NR	(<400U)	NR
2-Methylnaphthalene	36J	NR	(<810U)	NR	110J	NR	(<410U)	NR	140J	NR	100J	NR	(<400U)	NR
Acenaphthylene	72J	NR	77J	NR	(<490U)	NR	(<410U)	NR	(<410U)	NR	(<400U)	NR	(<400U)	NR

NOTE: DI = De-ionized water used as control for sample preservative.
$Na(SO_4)_2$ = Sodium bi-sulfate used as sample preservative.
NA = Not analyzed. Sample not analyzed due to laboratory error.
J = Estimated concentration below quantitation limits.
U = Not detected. Sample quantitation limits are shown as (<__U).
B = Compound detected in associated method blank.
NR = Not required.
Only those analytes detected in at least one of the samples are shown on this table.
Sample results were collected to assess potential removal options in the future, therefore, results were not compared to state or federal soil standards.
Soil samples collected for volatile organic compound analyses were split for preservation with de-ionized water (EPA Method 5035) and sodium bi-sulfate (EPA Method 8260B) to distinguish between analytical variances associated with laboratory preservation methods.

Analyte	Sample ID													
	S9-ASH-SB-2 8-16 ft bgs		S9-ASH-SB-2 8-16 ft bgs Duplicate		S9-ASH-SB-5 10-11 bgs		S9-ASH-SB-5 14-15 bgs		S9-ASH-SB-16 15-16 bgs		S9-ASH-SB 22 16-17 bgs		S9-ASH-SB 26 10-11 bgs	
	Preservative		Preservative		Preservative		Preservative		Preservative		Preservative		Preservative	
	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$
SEMIVOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8270C (µg/Kg) *(Continued)*														
Acenaphthene	140J	NR	93J	NR	840	NR	(<410U)	NR	790	NR	1,500	NR	(<400U)	NR
Dibenzofuran	90J	NR	100J	NR	310J	NR	(<410U)	NR	200J	NR	760	NR	(<400U)	NR
Fluorene	210J	NR	160J	NR	720	NR	(<410U)	NR	400J	NR	1,300	NR	(<400U)	NR
Phenanthrene	2,200	NR	1,600	NR	5,000	NR	200J	NR	1,700	NR	4,900	NR	50J	NR
Anthracene	620	NR	470J	NR	1,700	NR	51J	NR	510	NR	1,000	NR	(<400U)	NR
Carbazole	220J	NR	260J	NR	450J	NR	(<410U)	NR	230J	NR	440	NR	(<400U)	NR
Fluoranthene	4,100	NR	2,900	NR	6,100	NR	300J	NR	2,100	NR	2,500	NR	120J	NR
Pyrene	4,800	NR	3,500	NR	7,300	NR	420	NR	1,400	NR	2,700	NR	140J	NR
Butylbenzylphthalate	(<440U)	NR	(<810U)	NR	(<490U)	NR	(<410U)	NR	(<410U)	NR	72J	NR	(<400U)	NR
Benzo(a)anthracene	2,500	NR	1,800	NR	3,200	NR	160J	NR	780	NR	1,500	NR	66J	NR
Chrysene	2,100	NR	1,800	NR	3,000	NR	170J	NR	760	NR	1,300	NR	92J	NR
Bis(2-Ethylhexyl) phthalate	(<440U)	NR	(<810U)	NR	(<490U)	NR	(<410U)	NR	55J	NR	(<400U)	NR	36J	NR
Benzo(b)fluoranthene	2,700	NR	2,100	NR	1,900	NR	170J	NR	810	NR	1,400	NR	88J	NR
Benzo(k)fluoranthene	1,400	NR	1,700	NR	2,500	NR	150J	NR	570	NR	860	NR	63J	NR
Benzo(a)pyrene	2,200	NR	1,800	NR	2,700	NR	130J	NR	780	NR	1,300	NR	57J	NR
Indeno(1,2,3-cd)pyrene	1,400	NR	980	NR	1,500	NR	82J	NR	490	NR	950	NR	57J	NR
Dibenzo(a,h)anthracene	390J	NR	(<810U)	NR	440J	NR	(<410U)	NR	160J	NR	(<400U)	NR	(<400U)	NR
Benzo(g,h,i)perylene	1,100	NR	980	NR	1,400	NR	70J	NR	430	NR	830	NR	(<400U)	NR
TARGET ANALYTE LIST METALS BY EPA METHOD SERIES 6010/7000 (mg/Kg)														
Aluminum	8,100	NR	7,550	NR	50,000	NR	4,000	NR	10,800	NR	9,180	NR	7,880	NR
Antimony	5.8	NR	12.2	NR	175	NR	2,050	NR	(<0.12U)	NR	0.48B*	NR	0.13B*	NR
Arsenic	8.5	NR	10.1	NR	15.9	NR	19.5	NR	2.5	NR	3.1	NR	2.2	NR
Barium	185	NR	450	NR	520	NR	458	NR	21.7	NR	54.8	NR	15.2	NR
Beryllium	0.15B*	NR	0.25B*	NR	0.34B*	NR	0.41B*	NR	0.39B*	NR	0.49	NR	0.31B*	NR
Cadmium	7.2	NR	20.5	NR	35	NR	2.7B*	NR	(<0.32U)	NR	(<0.35U)	NR	(<0.32U)	NR
Calcium	6,050	NR	6,050	NR	8,480	NR	15,400	NR	1,190	NR	1,100	NR	1,000	NR
Chromium	26.5	NR	34.6	NR	87.9	NR	47.5	NR	12.7	NR	14.8	NR	9.8	NR
Cobalt	5.8B*	NR	6.9B*	NR	13.7B*	NR	16.4B*	NR	3.9	NR	4.1	NR	3.6	NR
Copper	509	NR	192	NR	3,040	NR	196	NR	7.2	NR	12	NR	6.3	NR

NOTE: B* = Analyte concentration is greater than the instrument detection limit, but less than the contract required detection limit.

Analyte	Sample ID													
	S9-ASH-SB-2 8-16 ft bgs		S9-ASH-SB-2 8-16 ft bgs Duplicate		S9-ASH-SB-5 10-11 bgs		S9-ASH-SB-5 14-15 bgs		S9-ASH-SB-16 15-16 bgs		S9-ASH-SB 22 16-17 bgs		S9-ASH-SB 26 10-11 bgs	
	Preservative		Preservative		Preservative		Preservative		Preservative		Preservative		Preservative	
	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$	DI	Na $(SO_4)_2$
TARGET ANALYTE LIST METALS BY EPA METHOD SERIES 6010/7000 (mg/Kg) ***(Continued)***														
Iron	44,400	NR	51,100	NR	104,000	NR	167,000	NR	10,700	NR	13,200	NR	9,290	NR
Lead	400	NR	490	NR	1,340	NR	1,440	NR	6.5	NR	29.4	NR	4	NR
Magnesium	1,150	NR	2,280	NR	1,860	NR	1,420	NR	2,220	NR	3,030	NR	1,820	NR
Manganese	308	NR	322	NR	870	NR	766	NR	105	NR	130	NR	101	NR
Mercury	0.1	NR	0.06	NR	0.17	NR	0.12	NR	0.02B*	NR	0.08	NR	0.01B*	NR
Nickel	29.1	NR	31.1	NR	83.6	NR	29.6B*	NR	11.8	NR	12.1	NR	10.1	NR
Potassium	538	NR	926	NR	757	NR	751	NR	690	NR	1,130	NR	702	NR
Selenium	1B*	NR	1.8B*	NR	(<1.29U)	NR	(<2.08U)	NR	0.19B*	NR	0.30B*	NR	0.20B*	NR
Silver	55.2	NR	9.9	NR	3.9B*	NR	1.7B*	NR	(<0.42U)	NR	0.68B*	NR	(<0.42U)	NR
Sodium	139	NR	189	NR	424	NR	98B*	NR	49.2B*	NR	65.7B*	NR	56.7B*	NR
Thallium	0.85B*	NR	0.79B*	NR	2.1B*	NR	(<2.95U)	NR	0.62B*	NR	0.69B*	NR	0.62B*	NR
Vanadium	8.1	NR	12.1	NR	21.2	NR	8.8B*	NR	18.2	NR	19.7	NR	15.9	NR
Zinc	714	NR	681	NR	3,500	NR	3,130	NR	22.2	NR	50.6	NR	18.0	NR

TABLE 2 SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM 31 MAY THROUGH 7 JUNE 2003

Analyte	MEG[a]	MCL[b]	S9-B1-6-8	S9-B1-8-12	S9-B2-10-14	S9-B2-16-18	S9-B2-20-24	S9-B3-10-14	S9-B3-20-24	S9-B3-30-34	S9-B3-39.5-43.5
VOLATILE ORGANIC COMPOUNDS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8260B (µg/L)											
Total Volatile Organic Compound	NC	NC	ND	7.61	ND	ND	25.64	12.36	94.6	4.4	ND
Total Chlorinated Volatile Organic Compound	NC	NC	ND	ND	ND	ND	ND	0.64	ND	ND	ND
Vinyl Chloride	0.15	0.15	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Chloroethane	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Trichlorofluoromethane	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Acetone	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	3.9J	4.9J	86	4.4J	(<10U)
Methylene Chloride	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Methyl tert-butyl ether	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	3.2	(<2U)	(<2U)	(<2U)	(<2U)
1,1-Dichloroethane	70	70	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
2-Butanone	NC	NC	(<10U)	3.5J	(<10U)	(<10U)	5.8J	3.7J	8.6J	(<10U)	(<10U)
cis-1,2-Dichloroethene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Chloroform	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	0.64J	(<2U)	(<2U)	(<2U)
Tetrahydrofuran	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	12	(<10U)	(<10U)	(<10U)	(<10U)
Trichloroethene	5	5	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Toluene	1,400	1,400	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrachloroethene	3	3	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Ethylbenzene	700	700	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Xylenes, total	600	600	(<2U)	3.21J	(<2U)	(<2U)	0.74J	2.58J	(<2U)	(<2U)	(<2U)
1,3,5-Trimethylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,2,4-Trimethylbenzene	NC	NC	(<2U)	0.90J	(<2U)	(<2U)	(<2U)	0.54J	(<2U)	(<2U)	(<2U)
n-Butylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Naphthalene	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)

(a) MEG (Maximum Exposure Guideline) obtained from State of Maine Department of Human Services Maximum Exposure Guidelines, memorandum dated 23 October 1992.
(b) MCL (Maximum contaminant Level) obtained from 40 CFR Parts 141 and 142 (U.S. EPA 1998).

NOTE: NC = No criteria.
ND = Not detected.
U = Not detected. Sample quantitation limits are shown as (<__U).
J = Estimated concentration below quantitation limits.
Only those analytes detected in at least one of the samples, and chemicals of concern listed in the Final Long-Term Monitoring Plan (EA 1999), are shown on this table.

Analyte	MEG[a]	MCL[b]	S9-B4-12-16	S9-B4-20-24	S9-B4-20-24 Duplicate	S9-B4-36-40	S9-B5-12-16	S9-B5-32-36	S9-B5-41-45	S9-B6-14-18	S9-B6-30-34
VOLATILE ORGANIC COMPOUNDS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8260B (µg/L)											
Total Volatile Organic Compound	NC	NC	7.7	17.3	15.82	3.07	10.87	4.59	1.64	10.41	4.86
Total Chlorinated Volatile Organic Compound	NC	NC	ND	2.48	2.44	1.97	ND	3.7	1.64	ND	3.1
Vinyl Chloride	0.15	2	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Chloroethane	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	1.8J	(<5U)	(<5U)	(<5U)
Trichlorofluoromethane	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	1.9J	(<2U)	(<2U)	(<2U)
Acetone	NC	NC	3.3J	(<10U)	(<10U)	(<10U)	4.4J	(<10U)	(<10U)	5.5J	(<10U)
Methylene Chloride	NC	5	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Methyl tert-butyl ether	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,1-Dichloroethane	70	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
2-Butanone	NC	NC	(<10U)	5.8J	5J	(<10U)	3.6J	(<10U)	(<10U)	3J	(<10U)
cis-1,2-Dichloroethene	NC	NC	(<2U)	0.64J	0.66J	1.2J	(<2U)	(<2U)	0.85J	(<2U)	1.6J
Chloroform	26	29	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrahydrofuran	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)
Trichloroethene	5	5	(<2U)	1.2J	1.2J	0.77J	(<2U)	(<2U)	0.79J	(<2U)	1.5J
Toluene	1,400	1,000	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrachloroethene	3	5	(<2U)	0.64J	0.58J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Ethylbenzene	700	700	(<2U)	0.72J	0.68J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	0.66J
Xylenes, total	600	10,000	(<2U)	5.4J	5.1J	1.1J	2.32J	0.89J	(<2U)	1.91J	1.1J
1,3,5-Trimethylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,2,4-Trimethylbenzene	NC	NC	(<2U)	1.5J	1.4J	(<2U)	0.55J	(<2U)	(<2U)	(<2U)	(<2U)
n-Butylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Naphthalene	NC	NC	4.4J	1.4J	1.2J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)

Analyte	MEG[a]	MCL[b]	S9-B6-47-51	S9-B7-12-16	S9-B7-24-28	S9-B7-32-36	S9-B7 48-52	S9-B8 14-18	S9-B8 22-26	S9-B8 28-32
VOLATILE ORGANIC COMPOUNDS BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8260B (µg/L)										
Total Volatile Organic Compound	NC	NC	15.82	ND	ND	ND	5.69	10.67	8.05	4.25
Total Chlorinated Volatile Organic Compound	NC	NC	15.82	ND	ND	ND	4.9	10.67	7.1	3.15
Vinyl Chloride	0.15	2	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	**7.1**	**7.1**	(<2U)
Chloroethane	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Trichlorofluoromethane	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Acetone	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)
Methylene Chloride	NC	5	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Methyl tert-butyl ether	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,1-Dichloroethane	70	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	0.97J	(<2U)	(<2U)
2-Butanone	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)
cis-1,2-Dichloroethene	NC	NC	6.8	(<2U)	(<2U)	(<2U)	2.9	2.6	(<2U)	2.3
Chloroform	26	29	0.72J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrahydrofuran	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)
Trichloroethene	5	5	**7.3**	(<2U)	(<2U)	(<2U)	2	(<2U)	(<2U)	0.85J
Toluene	1,400	1,000	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrachloroethene	3	5	1J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Ethylbenzene	700	700	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Xylenes, total	600	10,000	(<2U)	(<2U)	(<2U)	(<2U)	0.79J	(<2U)	0.95J	1.1J
1,3,5-Trimethylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,2,4-Trimethylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
n-Butylbenzene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Naphthalene	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)

NOTE: Results in bold indicate exceedance of MEG or MCL.

Analyte	MEG[a]	MCL[b]	S9-B9-10-14	S9-B9-14-18	S9-B9-14-18 Duplicate	S9-B9-20-24	Trip Blank	Rinsate Blank	Source Water Blank
VOLATILE ORGANIC COMPOUNDS BY EPA U.S. ENVIRONMENTAL PROTECTION AGENCY 8260B (µg/L)									
Total Volatile Organic Compound	NC	NC	75.18	8.15	9.12	3.94	ND	26.69	15.2
Total Chlorinated Volatile Organic Compound	NC	NC	ND	6.24	6.29	3.1	ND	11.7	6
Vinyl Chloride	0.15	2	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Chloroethane	NC	NC	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)
Trichlorofluoromethane	NC	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Acetone	NC	NC	11	(<10U)	(<10U)	(<10U)	(<10U)	3.9J	(<10U)
Methylene Chloride	NC	5	(<5U)	(<5U)	(<5U)	(<5U)	(<5U)	**7.1**	**9.2**
Methyl tert-butyl ether	NC	NC	0.54J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,1-Dichloroethane	70	NC	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
2-Butanone	NC	NC	37	(<10U)	(<10U)	(<10U)	(<10U)	6.7J	(<10U)
cis-1,2-Dichloroethene	NC	NC	(<2U)	2.4	2.5	1.4J	(<2U)	(<2U)	(<2U)
Chloroform	26	29	(<2U)	0.63J	0.74J	(<2U)	(<2U)	4.6	6
Tetrahydrofuran	NC	NC	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)	(<10U)
Trichloroethene	5	5	(<2U)	2.5	2.4	1.7J	(<2U)	(<2U)	(<2U)
Toluene	1,400	1,000	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Tetrachloroethene	3	5	(<2U)	0.71J	0.65J	(<2U)	(<2U)	(<2U)	(<2U)
Ethylbenzene	700	700	1.5J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Xylenes, total	600	10,000	12.7	1.91J	2.3J	0.84J	(<2U)	2.29J	(<2U)
1,3,5-Trimethylbenzene	NC	NC	1.2J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
1,2,4-Trimethylbenzene	NC	NC	5.1	(<2U)	0.53J	(<2U)	(<2U)	0.70J	(<2U)
n-Butylbenzene	NC	NC	0.64J	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Naphthalene	NC	NC	5.5	(<2U)	(<2U)	(<2U)	(<2U)	1.4J	(<2U)

MATERIAL SAFETY DATA SHEET

DOD Hazardous Material Information

FLY ASH

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
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Section 1 - Product Identification
FLY ASH

Product Identification: FLY ASH
Date of MSDS: 10/10/1984 **Technical Review Date:** 10/20/1988

Preparer Information

Preparer's Name: WESTERN ASH COMPANY
Post Office Box: N/K
Preparer's Address1: 7998 HOLLYWOOD KLAY
Preparer's Address2: SUN VALLEY, CA 91352

Preparer's CAGE: FO282
Assigned Individual: Y

Contractor Information

Contractor's Name: WESTERN ASH COMPANY
Post Office Box: N/K
Contractor's Address1: 7998 HOLLYWOOD KLAY
Contractor's Address2: SUN VALLEY, CA 91352
Contractor's Telephone: (818) 768-8418
Contractor's CAGE: FO282

Section 2 - Compositon/Information on Ingredients
FLY ASH

Ingredient Name: ALPHA-ALUMINA (ALUMINUM OXIDE) (EPA LISTS ONLY FIBROUS FORMS) (SARA III)
Ingredient CAS Number: 1344-28-1 **Ingredient CAS Code:** M
RTECS Number: BD1200000 **RTECS Code:** M
OSHA PEL: 15 MG/M3 TDUST **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/M3 TDUST; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: CALCIUM OXIDE
Ingredient CAS Number: 1305-78-8 **Ingredient CAS Code:** M
RTECS Number: EW3100000 **RTECS Code:** M
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 MG/M3; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: IRON OXIDE
Ingredient CAS Number: 1309-37-1 **Ingredient CAS Code:** M
RTECS Number: NO7400000 **RTECS Code:** M
OSHA PEL: 10 MG/M3 (FE) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3(FE),B2; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**

EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: MAGNESIUM OXIDE
Ingredient CAS Number: 1309-48-4 **Ingredient CAS Code:** M
RTECS Number: OM3850000 **RTECS Code:** M
OSHA PEL: 15 MG/M3 PARTICULATE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/M3;TDUST; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: SILICA, AMORPHOUS, DUST
Ingredient CAS Number: 112945-52-5 **Ingredient CAS Code:** M
RTECS Number: VV7310000 **RTECS Code:** M
Other REC Limits: 3 MG/CUM RESP. DUST
OSHA PEL: 6 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/M3; 8990 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
FLY ASH

Health Hazards Acute & Chronic: EXPOSURE TO EXCESSIVE CONCENTRATION OF DUST FOR LONG PERIODS OF TIME MAY CAUSE PULMONARY DISEASE. CAN CAUSE MINOR SKIN IRRITATION.

Signs & Symptoms of Overexposure:
EXCESSIVE DUST CONCENTRATION MAY CAUSE PULMONARY DISEASE. MINOR SKIN IRRITATION.

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: TLV 10 MG/CUM
Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO
Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
FLY ASH

First Aid: Use standard first aid measures for flushing/washing soil from skin.

Section 5 - Fire Fighting Measures
FLY ASH

Fire Fighting Procedures: none
Unusual Fire or Explosion Hazard: none
Extinguishing Media: none
Flash Point: Flash Point Text: NON-FLAMMABLE
Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): none
Upper Limit(s): none

Section 6 - Accidental Release Measures
FLY ASH

Spill Release Procedures:
VACUUM OR SWEEP UP SPILL. IF SWEEPING IS NECESSARY, USE DUST SUPPRESSANT AGENT. FOR LARGE SPILLS, CAN WET DOWN AND SCOOP UP.

Section 7 - Handling and Storage
FLY ASH

Handling and Storage Precautions: handle as soil, keep out of face and eyes to the extent possible, wash as necessary

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
FLY ASH

Repiratory Protection:
NIOSH APPROVED FOR PROTECTION AGAINST PNEUMOCONIOSIS PRODUCING DUSTS.

Ventilation:
PROVIDE LOCAL EXHAUST VENTILATION TO KEEP <TLV.
Protective Gloves:
NORMALLY NO NECESSARY
Eye Protection: NORMALLY NOT NECESSARY
Other Protective Equipment: N/K
Work Hygenic Practices: N/K
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
FLY ASH

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/R
Melting/Freezing Point: Melting/Freezing Text: N/R
Decomposition Point: Decomposition Text: N/R
Vapor Pressure: N/R **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: N/R
Volatile Organic Content Pounds per Gallon:
pH: N/R
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/R
Solubility in Water: SLIGHT
Appearance and Odor: N/K
Percent Volatiles by Volume: N/R
Corrosion Rate: N/R

Section 10 - Stability & Reactivity Data
FLY ASH

Stability Indicator: YES
Materials to Avoid:
N/K
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
N/K
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
FLY ASH

Toxicological Information: N/P

Section 12 - Ecological Information
FLY ASH

Ecological Information: N/P

Section 13 - Disposal Considerations
FLY ASH

Waste Disposal Methods:
LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
FLY ASH

Transport Information: N/P

Section 15 - Regulatory Information
FLY ASH

SARA Title III Information: N/P
Federal Regulatory Information: N/P
State Regulatory Information: N/P

Section 16 - Other Information
FLY ASH

Other Information: N/P

HAZCOM Label Information

Product Identification: FLY ASH
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P

Health Hazard: none
Contact Hazard: none
Fire Hazard: none
Reactivity Hazard: none

CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

GASOLINE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
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Section 1 - Product and Company Identification
GASOLINE

Product Identification: GASOLINE
Date of MSDS: 01/01/1987 **Technical Review Date:** 07/17/1999
FSC: 9130 **NIIN:** 00-148-7102
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: FRONTIER OIL AND REFINING COMPANY
Manufacturer's Address1: 1600 BROADWAY
Manufacturer's Address2: DENVER, CO 80202
Manufacturer's Country: US
General Information Telephone: 307-634-3551
Emergency Telephone: 307-634-3551 CHEMTREC 800-424-9300
Emergency Telephone: 307-634-3551 CHEMTREC 800-424-9300
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 0A0Y5
Special Project Code: N

Item Description

Item Name: GASOLINE,AUTOMOTIVE
Item Manager:
Specification Number: ASTM D4814
Type/Grade/Class: CL A,B,C,D,E,SPEC GR
Unit of Issue: GL
Unit of Issue Quantity: X
Type of Container: UNKNOWN

Contractor Information

Contractor's Name: FRONTIER OIL AND REFINING COMPANY
Contractor's Address1: 1600 BROADWAY
Contractor's Address2: DENVER, CO 80202
Contractor's Telephone: 307-634-3551 CHEMTREC 800-424-9300
Contractor's CAGE: 0A0Y5

Section 2 - Compositon/Information on Ingredients
GASOLINE

Ingredient Name: BENZENE (SARA III)
Ingredient CAS Number: 71-43-2 **Ingredient CAS Code:** M
RTECS Number: CY1400000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K

Manufacturer's Information

Manufacturer's Name: PRIMARY CORPORATION
Manufacturer's Address1: 5601 IRONBRIDGE PARKWAY, SUITE 100
Manufacturer's Address2: CHESTER, VA 23831
Manufacturer's Country: US
General Information Telephone: 804-230-1747
Emergency Telephone: 804-230-1747
Emergency Telephone: 804-230-1747
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: PRIMA
Special Project Code: N

Item Description

Item Name: DIESEL FUEL
Item Manager:
Specification Number: VV-F-800
Type/Grade/Class: GRADE DF-2
Unit of Issue: GL
Unit of Issue Quantity: X
Type of Container: BULK

Contractor Information

Contractor's Name: PRIMARY CORPORATION
Contractor's Address1: 5601 IRONBRIDGE PARKWAY, SUITE 100
Contractor's Address2: CHESTER, VA 23831
Contractor's Telephone: 804-230-1747
Contractor's CAGE: PRIMA

Section 2 - Compositon/Information on Ingredients
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Ingredient Name: AROMATIC HYDROCARBONS
Ingredient CAS Number: 70995-17-8 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 15-45

% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: DISTILLATES,STREIGHT RUN MIDDLE
Ingredient CAS Number: 64741-44-2 **Ingredient CAS Code:** M
RTECS Number: LX3296000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: SATURATED HYDROCARBONS
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 54-85
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M

OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: UNSATURATED HYDROCARBONS
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 1-6
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Health Hazards Acute & Chronic: EYES:IRRITATION. SKIN:SKIN IRRITANT. INHALATION:LUNG IRRITATION, CNS EFFECTS. INGESTION:PRACTICALLY NON-TOXIC TO INTERNAL ORGANS. HOWEVER, IF ASPIRATED INTO LUNGS IT MAY CAUSE CHEMICAL PNEUMONITIS WHI CH CAN BE FATAL. CHRONIC:MIDDLE DISTILLATE HAS CAUSED SKIN CANCER WHEN REPEATEDLY APPLIED TO MICE OVER LIFETIME,KIDNEY.

Signs & Symptoms of Overexposure:
SKIN:IRRITAION, DRYING EFFECT. INHALATION: HEADACHE, DIZZINESS, LOSS OF APPETITE, WEAKNESS AND LOSS OF COORDINATION.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: UNKNOWN

Route of Entry Indicators:

Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: WHOLE DIESEL ENGINE EXHAUST IS LISTED AS A PROBABLE CARCINOGEN BY IARC AND NIOSH.

Section 4 - First Aid Measures
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

First Aid:
EYES:FLUSH WITH FRESH WATER FOR 15 MINUTES. SKIN: REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH SOAP AND WATER. SEE A DOCTOR IF SYMPTOMS DEVELOP. INHALATION: REMOVE TO FRESH AIR. INGESTION: GIVE WATER OR MILK TO DRINK AND GET IMMEDIATE MEDICAL ATTENTION. DO NOT MAKE PERSON VOMIT UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL.

Section 5 - Fire Fighting Measures
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Fire Fighting Procedures:
WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire or Explosion Hazard:
COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. LIQUID EVAPORATES AND FORMS VAPORS WHICH CAN CATCH FIRE WITH VIOLENT BURNING
Extinguishing Media:
USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Flash Point: Flash Point Text: 130F,54C

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): 0.7
Upper Limit(s): 5.0

Section 6 - Accidental Release Measures
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Spill Release Procedures:
THIS MATERIAL IS CONSIDERED TO BE A WATER POLLUTANT AND RELEASES OF THIS PRODUCT SHOULD BE PREVENTED. ELIMINATE ALL OPEN FLAMES. STOP SOURCE OF THE LEAK. CONTAIN LIQUID. CLEAN UP SPILL USING APPROPRIA TE TECHNIQUES SUCH AS ABSORBENT MATERIALS.

Section 7 - Handling and Storage
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Repiratory Protection:
NONE NORMALLY REQUIRED. USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF TLV IS EXCEEDED OR WHEN SPRAYING OR USING IN CONFINED SPACES.
Ventilation:
USE THIS MATERIAL ONLY IN WELL VENTILATED AREAS.
Protective Gloves:
PVC
Eye Protection: GOGGLES
Other Protective Equipment: WEAR PROTECTIVE CLOTHINGS.
Work Hygenic Practices: WASH HANDS THOROUGHLY AFTER HANDLING THIS PRODUCT.
Supplemental Health & Safety Information: NONE

Section 9 - Physical & Chemical Properties
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

HCC: F4
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 320F,160C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: 1 **Vapor Density:** 4-5
Percent Volatile Organic Content:
Specific Gravity: 0.8
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: 1.9 CST
Evaporation Weight and Reference: N/K
Solubility in Water: NEGLIGIBLE
Appearance and Odor: CLEAR LIGHT AMBER LIQUID, FUEL OIL ODOR
Percent Volatiles by Volume: NIL
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZING AGENTS

Stability Condition to Avoid:
HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Hazardous Decomposition Products:
TOXIC CARBON MONOXIDE AND CARBON DIOXIDE, AND SULFUR DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Toxicological Information:
N/P

Section 12 - Ecological Information
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Ecological Information:
N/P

Section 13 - Disposal Considerations
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Waste Disposal Methods:
PLACE CONTAMINATED MATERIALS IN DISPOSABLE CONTAINERS AND DISPOSE OF IN A MANNER CONSISTENT WITH APPLICABLE REGULATIONS. CANTACT LOCAL ENVIRONMENTAL OR HEALTH AUTHORITIES FOR APPROVED DISPOSAL OF THIS MATERIAL.

Section 14 - MSDS Transport Information
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Transport Information:
N/P

Section 15 - Regulatory Information
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Other Information:
N/P

HMIS Transportation Information

Product Identification: DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.

Transporation ID Number: 66799
Responsible Party CAGE: PRIMA
Date MSDS Prepared: 01/01/1987
Date MSDS Reviewed: 12/11/1992
MFN: 12/11/1992
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: GL
Container Quantity: X
Type of Container: BULK
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number: MIDDLE DISTILLATE, HYDROCARBONS(MIXTURE OF SATURATED,UNSATURATED AND AROMATIC).
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
NONE

Department of Transportation Information
DOT Proper Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
DOT PSN Code: GTF
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1202
DOT Packaging Group: III
Label: FLAMMABLE LIQUID
Special Provision(s): B1,T7,T30
Packaging Exception: 150
Non Bulk Packaging: 203
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information
IMO Proper Shipping Name: GAS OIL

IMO PSN Code: HRR
IMO PSN Modifier:
IMDG Page Number: 3375
UN Number: 1202
UN Hazard Class: 3.3
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 3-07
Medical First Aid Guide Number: 311

IATA Detail Information

IATA Proper Shipping Name: GAS OIL
IATA PSN Code: MTX
IATA PSN Modifier:
IATA UN Id Number: 1202
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 309
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 310
Maximum Quantity for Cargo: 220L
Exceptions: A3

AFI Detail Information

AFI Proper Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
AFI Symbols:
AFI PSN Code: MTX
AFI PSN Modifier:
AFI UN Id Number: UN1202
AFI Hazard Class: 3
AFI Packing Group: III
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: DIESEL FUEL;NO. 2 DIESEL FUEL;NO. 2 OIL;NO.
CAGE: PRIMA
Assigned Individual: N
Company Name: PRIMARY CORPORATION
Company PO Box:
Company Street Address1: 5601 IRONBRIDGE PARKWAY, SUITE 100
Company Street Address2: CHESTER, VA 23831 US
Health Emergency Telephone: 804-230-1747
Label Required Indicator: Y
Date Label Reviewed: 12/11/1992
Status Code: C
Manufacturer's Label Number: NONE
Date of Label: 12/11/1992
Year Procured: 1992
Organization Code: F
Chronic Hazard Indicator: Y

Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: Moderate
Reactivity Hazard: None

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MATERIAL SAFETY DATA SHEETS

DOD Hazardous Material Information

TRICHLOR,TRICHLOROETLHYLENE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

Section 1 - Product and Company Identification
TRICHLOR,TRICHLOROETLHYLENE

Product Identification: TRICHLOR,TRIC HLOROETLHYLENE
Date of MSDS: 11/01/1985 **Technical Review Date:** 03/30/1989
FSC: 6810 **NIIN:** 00-184-4794
Submitter: D DG
Status Code: C
MFN: 01

Article: N
Kit Part: N

Item Description

Item Name: TRICHLOROETHYLENE,TECHNICAL
Item Manager: S9G
Specification Number: UNKNOWN
Type/Grade/Class: NK
Unit of Issue: CN **Quantitative Expression:** 00000000005GL
Unit of Issue Quantity: 1
Type of Container: CAN

Section 2 - Compositon/Information on Ingredients
TRICHLOR,TRIC HLOROETLHYLENE

Ingredient Name: TRICHLOROETHYLENE (SARA III)
Ingredient CAS Number: 79-01-6 **Ingredient CAS Code:** M
RTECS Number: KX4550000 **RTECS Code:** M
OSHA PEL: 100 PPM
OSHA STEL: 100 PPM
ACGIH TLV: 50 PPM/100,A5STEL;93 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
TRICHLOR,TRICHLOROETLHYLENE

Health Hazards Acute & Chronic: ACUTE:IRRITATION OF EYES,SKIN AND RESPIRATORY TRSCT:CNS DEPRESSION,DIZZINESS,NAUSEA,HEADACHE,LOSS OF CO-ORDINATION;G.I.TRACT DISTURBANCE,VOMITING;PULMONARY EDMA POSSIBLE. CARONIC DERMATITIS, IRRITATIO N,LIVER & KIDNEY DAMAGE.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS DATA

Medical Conditions Aggravated by Exposure:
PRE-EXISTING CONDITIONS MAY BE WORSEN.

LD50 LC50 Mixture: ORAL RAT:4900-7000 MG/KG
Route of Entry Indicators:
Inhalation: YES
Skin: YES

Ingestion: YES

Carcenogenicity Indicators

NTP: NO

IARC: YES

OSHA: NO

Carcinogenicity Explanation: LAB ANIMAL STUDY SHOWS TUMER IN MICE:THERE IS EVIDENCE THAT TCE POSES CARCINOGENIC RISK TO HUMANS.

Section 4 - First Aid Measures
TRICHLOR,TRIC HLOROETLHYLENE

First Aid:

INHALATION: REMOVE TO FRESH AIR;CALL A PHYSICIAN IF NEEDED.
SKIN AND EYES: FLUSH WITH PLENTY OF WATER FOR ABOUT 15 MINUTES;(SEEK MEDICAL HELP
INGESTION: DO REDUCE VOMITING;CALL A PHYSICIAN IMMEDIATELY.

Section 5 - Fire Fighting Measures
TRICHLOR,TRICHLOROETLHYLENE

Fire Fighting Procedures:

USE NIOSH/MSHA APPROVED SCBA IN AN ENCLOSED AREA(WITH FULL PROTECTION)

Unusual Fire or Explosion Hazard:

DECOMPSOTION OR BURNING CAN PRODUCE HCL OR POSSIBLE TRACE OF PHOSGENE.

Extinguishing Media:

WATER DRY CHEMICAL, CO*2.

Flash Point: Flash Point Text: NONE

Autoignition Temperature:

Autoignition Temperature Text: N/K

Lower Limit(s): N/K

Upper Limit(s): N/K

Section 6 - Accidental Release Measures
TRICHLOR,TRIC HLOROETLHYLENE

Spill Release Procedures:

USE PROPER PESONAL PROTECTION+REMOVE ALL IGNITION SOURCES;CONTAIN FREE LIQUID IF POSSIBLE+USE SUITABLE INERT ABSORBENT MATERIAL AND RECOVER FOR PROPER DISPOSAL

Section 7 - Handling and Storage
TRICHLOR,TRICHLOROETLHYLENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TRICHLOR,TRICHLOROETLHYLENE

Repiratory Protection:
USE NIOSH/MSHA APPROVED RESPIRATORY FOR TCE IF ABOVE PEL/TLV OR SCBA IN AN ENCLOSED AREA.
Ventilation:
LOCAL EXHAUST OR GENERAL TO MAINTAIN PEL/TLV.
Protective Gloves:
VITON,PVA OR ANY IMPERVIOUS
Eye Protection: SPLASH PROOF GOGGLES.
Other Protective Equipment: BOOTS, APRONS, EYE WASH FACILITES, SAFETY SHOWER.
Work Hygenic Practices: AVOID CONTACT WITH EYES AND SKIN; DO NOT BREATHE VAPORS/MIST: DO NOT EAT, DRINK OR SMOKE IN AN ENCLOSED AREA.
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
TRICHLOR,TRICHLOROETLHYLENE

HCC: T4
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 190F/88C
Melting/Freezing Point: Melting/Freezing Text: -86.4C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 58 MMHG **Vapor Density:** 4.54
Percent Volatile Organic Content:
Specific Gravity: 1.465
Volatile Organic Content Pounds per Gallon:
pH: 6.7-7
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 0.28 (ETHYL ETHER=1)
Solubility in Water: NEGLIGIBLE
Appearance and Odor: CLEAR,COLOR-LESS LIQUID WITH ETHER-LIKE ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
TRICHLOR,TRICHLOROETLHYLENE

Stability Indicator: YES
Materials to Avoid:
CAUSTIC SODA,CAUSTIC POTASH,OXIDIZING MATERIALS:SHOCK SENSITIVE COMPOUND MAY FORMED.
Stability Condition to Avoid:
OPEN FLAME,HOT SURFACES
Hazardous Decomposition Products:
HCL AND POSSIBLE TRACES OF PHOSGENE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
TRICHLOR,TRICHLOROETLHYLENE

Toxicological Information:
N/P

Section 12 - Ecological Information
TRICHLOR,TRICHLOROETLHYLENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
TRICHLOR,TRICHLOROETLHYLENE

Waste Disposal Methods:
DISPOSE OF COLLECTED MATERIAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS=1000LBS

Section 14 - MSDS Transport Information
TRICHLOR,TRICHLOROETLHYLENE

Transport Information:
N/P

Section 15 - Regulatory Information
TRICHLOR,TRICHLOROETLHYLENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P

State Regulatory Information:
N/P

Section 16 - Other Information
TRICHLOR,TRICHLOROETLHYLENE

Other Information:
N/P

HMIS Transportation Information

Product Identification: TRICHLOR,TRICHLOROETLHYLENE
Transporation ID Number: 54848
Date MSDS Prepared: 11/01/1985
Date MSDS Reviewed: 03/30/1989
MFN: 03/30/1989
Submitter: D DG
Status Code: C
Container Information
- **Unit of Issue:** CN
- **Container Quantity:** 1
- **Type of Container:** CAN
- **Net Unit Weight:** 5.0 GL

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: TRICHLOROETHYLENE
DOT PSN Code: OQK
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN1710
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD

Special Provision(s): N36,T1
Packaging Exception: 153
Non Bulk Packaging: 203
Bulk Packaging: 241
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: TRICHLOROETHYLENE
IMO PSN Code: OVL
IMO PSN Modifier: P
IMDG Page Number: 6273
UN Number: 1710
UN Hazard Class: 6.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-02
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: TRICHLOROETHYLENE
IATA PSN Code: YMD
IATA PSN Modifier:
IATA UN Id Number: 1710
IATA UN Class: 6.1
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: TOXIC
Packaging Note for Passengers: 605
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 612
Maximum Quantity for Cargo: 220L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: TRICHLOROETHYLENE
AFI Symbols:
AFI PSN Code: YMD
AFI PSN Modifier:
AFI UN Id Number: UN1710
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:
Special Provisions: P5, N36
Back Pack Reference: A10.5

HAZCOM Label Information

Product Identification: TRICHLOR,TRIC HLOROETLHYLENE
CAGE: 82925
Assigned Individual: N
Company Name: OCTAGON PROCESS INC.
Company PO Box:
Company Street Address1: 596 RIVER ROAD
Company Street Address2: EDGEWATER, NJ 07020 US
Health Emergency Telephone: 201-945-9400
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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MATERIAL DATA SAFETY SHEETS

DOD Hazardous Material Information

TRANS-1,2-DICHLOROETHYLENE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

Section 1 - Product and Company Identification
TRANS-1,2-DICHLOROETHYLENE

Product Identification: TRANS-1,2-DICHLOROETHYLENE
Date of MSDS: 11/14/1994 **Technical Review Date:** 01/26/1999
FSC: 6850 **NIIN:** 01-412-0023
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Item Description

Item Name: CLEANING COMPOUND,SOLVENT
Item Manager: S9G
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: CN **Quantitative Expression:** 00000000005GL
Unit of Issue Quantity: 0
Type of Container: CAN

Section 2 - Compositon/Information on Ingredients
TRANS-1,2-DICHLOROETHYLENE

Ingredient Name: TRANS-1,2-DICHLOROETHYLENE (SEE RTTECS KV9360000 FOR LIMITS) (SARA III)
Ingredient CAS Number: 156-60-5 **Ingredient CAS Code:** M
RTECS Number: KV9400000 **RTECS Code:** M
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
TRANS-1,2-DICHLOROETHYLENE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
N/P

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P
Route of Entry Indicators:
- **Inhalation:** N/P
- **Skin:** N/P
- **Ingestion:** N/P

Carcenogenicity Indicators
- **NTP:** N/P
- **IARC:** N/P
- **OSHA:** N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
TRANS-1,2-DICHLOROETHYLENE

First Aid:
N/P

Section 5 - Fire Fighting Measures
TRANS-1,2-DICHLOROETHYLENE

Fire Fighting Procedures:
FIRE FIGHTERS SHOULD WEAR SELF CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. COOL TANKS AND CONTAINERS EXPOSED TO FIRE WITH WATER.
Unusual Fire or Explosion Hazard:
VAPORS CONCENTRATED IN CONFINED OR POORLY VENTILATED AREA CAN BE IGNITED WITH EXTREME HEAT/IGNITION SOURCE. VAPORS MAY TRAVEL TO IGNITION SOURCE AND FLASH BACK.
Extinguishing Media:
FOAM, CARBON DIOXIDE, DRY CHEMICAL, WATER SPRAY
Flash Point: =2.2C, 36.F **Flash Point Text:**
Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 9.70 %
Upper Limit(s): 12.8 %

Section 6 - Accidental Release Measures
TRANS-1,2-DICHLOROETHYLENE

Spill Release Procedures:
N/P

Section 7 - Handling and Storage
TRANS-1,2-DICHLOROETHYLENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TRANS-1,2-DICHLOROETHYLENE

Repiratory Protection:
N/P
Ventilation:
N/P

Protective Gloves:
N/P
Eye Protection: N/P
Other Protective Equipment: N/P
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
TRANS-1,2-DICHLOROETHYLENE

HCC: F2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: =47.8C, 118.F **Boiling Point Text:**
Melting/Freezing Point: =-50.C, -58.F **Melting/Freezing Text:**
Decomposition Point: Decomposition Text: N/P
Vapor Pressure: 400 **Vapor Density:** 3.34
Percent Volatile Organic Content:
Specific Gravity: 1.2565
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT GIVEN
Solubility in Water: SLIGHT
Appearance and Odor: CLEAR, COLORLESS LIQUID WITH A PLEASANT ODOR
Percent Volatiles by Volume: N/K
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
TRANS-1,2-DICHLOROETHYLENE

Stability Indicator: NO
Materials to Avoid:
STRONG OXIDIZING AGENTS, CAUSTIC SODA, CAUSTIC POTASH. SHOCK SENSITIVE COMPOUNDS MAY BE FORMED.
Stability Condition to Avoid:
STEAM, ELEVATED TEMPERATURES
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: N/P
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
TRANS-1,2-DICHLOROETHYLENE

Toxicological Information:
N/P

Section 12 - Ecological Information
TRANS-1,2-DICHLOROETHYLENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
TRANS-1,2-DICHLOROETHYLENE

Waste Disposal Methods:
N/P

Section 14 - MSDS Transport Information
TRANS-1,2-DICHLOROETHYLENE

Transport Information:
N/P

Section 15 - Regulatory Information
TRANS-1,2-DICHLOROETHYLENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
TRANS-1,2-DICHLOROETHYLENE

Other Information:
N/P

HMIS Transportation Information

Product Identification: TRANS-1,2-DICHLOROETHYLENE
Transporation ID Number: 134654
Responsible Party CAGE: 47695
Date MSDS Prepared: 11/14/1994
Date MSDS Reviewed: 03/19/1996
MFN: 03/19/1996
Submitter: D DG
Status Code: C

Container Information

Unit of Issue: CN
Container Quantity: 0
Type of Container: CAN
Net Unit Weight: 52.4 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: 1,2-$DICHLOROETHYLENE
DOT PSN Code: EUD
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1150
DOT Packaging Group: II
Label: FLAMMABLE LIQUID
Special Provision(s): T14
Packaging Exception:
Non Bulk Packaging: 202
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 L
Maximimum Quanity in Cargo Area: 60 L
Stow in Vessel Requirements: B
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: 1,2-$DICHLOROETHYLENE
IMO PSN Code: FKP
IMO PSN Modifier:
IMDG Page Number: 3205
UN Number: 1150
UN Hazard Class: 3.2
IMO Packaging Group: II

Subsidiary Risk Label: -
EMS Number: 3-07
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: 1,2-$DICHLOROETHYLENE
IATA PSN Code: IXI
IATA PSN Modifier:
IATA UN Id Number: 1150
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 305
Maximum Quantity for Passengers: 5L
Packaging Note for Cargo: 307
Maximum Quantity for Cargo: 60L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: DICHLOROETHYLENE
AFI Symbols:
AFI PSN Code: IXI
AFI PSN Modifier:
AFI UN Id Number: UN1150
AFI Hazard Class: 3
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: TRANS-1,2-DICHLOROETHYLENE
CAGE: 47695
Assigned Individual: N
Company Name: PPG INDUSTRIES INC
Company PO Box:
Company Street Address1: ONE PPG PLACE
Company Street Address2: PITTSBURGH, PA 15272 US
Health Emergency Telephone: 412-434-3131
Label Required Indicator: Y
Date Label Reviewed: 03/19/1996
Status Code: C
Manufacturer's Label Number: NONE
Date of Label: 03/19/1996
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES

Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Moderate
Reactivity Hazard: Slight

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MATERIAL SAFETY DATA SHEETS

DOD Hazardous Material Information

VINYL CHLORIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

Section 1 - Product and Company Identification
VINYL CHLORIDE

Product Identification: VINYL CHLORIDE
Date of MSDS: 10/01/1985 **Technical Review Date:** 10/09/1992
FSC: 6810 **NIIN: LIIN:** 00N034925

Manufacturer's Information

Manufacturer's Name: MATHESON GAS PRODUCTS
Manufacturer's Address1: 932 PATTERSON PLANK RD
Manufacturer's Address2: EAST RUTHERFORD, NJ 07073
Manufacturer's Country: US

General Information Telephone: 201-933-2400
Emergency Telephone: 201-933-2400
Emergency Telephone: 201-933-2400
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0FB11
Special Project Code: N

Contractor Information

Contractor's Name: MATHESON GAS PRODUCTS
Contractor's Address1: 30 SEAFIEW DRIVE
Contractor's Address2: SEACAUCUS, NJ 07096
Contractor's Telephone: 201-867-4100, CHEMTREC 800-424-9300
Contractor's CAGE: 0FB11

Section 2 - Compositon/Information on Ingredients
VINYL CHLORIDE

Ingredient Name: ETHYLENEM, CHLORO-; (VINYL CHLORIDE) (SARA III)
Ingredient CAS Number: 75-01-4 **Ingredient CAS Code:** M
RTECS Number: KU9625000 **RTECS Code:** M
Other REC Limits: N/K
OSHA PEL: SEE 1910.1017 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 PPM, A1; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
VINYL CHLORIDE

Health Hazards Acute & Chronic: ACUTE:INHAL MAY CAUSE DROWS, BLURRED VISION, STAG GAIT, & TINGLING & NUMBNESS IN THE FEET & HANDS. IN HIGH CONC VINYL CHLORIDE ACTS AS AN ANESTHETIC. CONTACT WITH LIQ VINYL CHLORIDE MAY CAUSE SEVERE I RRITATION & BURNS. CHRONIC: VINYL CHLORIDE IS A RECOGNIZED CARCINOGEN & HAS CAUSED CANCER IN MAN.(EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES
Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: YES
Carcinogenicity Explanation: VINYL CHLORIDE: KNOWN CARCINOGEN (NTP), GROUP 1 (IARC); OSHA REGULATED

Section 4 - First Aid Measures
VINYL CHLORIDE

First Aid:
INHAL: MOVE VICTIM TO FRESH AIR. IF NOT BRTHG, GIVE ARTF RESP. IF BRTHG IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN. EYE/SKIN: IMMED FLUSH EYE/SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MIN. REMOVE CON TAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. INGEST: GET MD IMMEDIATELY (FP N). NOTE: SKIN BURNS CAN BE TREATED BY THE APPLICATION OF MAGNESIUM PASTE (MAGNESIUM OXIDE AND GLYCERINE).

Section 5 - Fire Fighting Measures
VINYL CHLORIDE

Fire Fighting Procedures:
FIRE FIGHTERS MUST WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). FIREIGHTERS TURNOUT GEAR IS INADEQUATE.
Unusual Fire or Explosion Hazard:
CYLINDERS THAT ARE EXPOSED TO FIRE MAY RUPTURE WITH VIOLENT FORCE. EXTING SURROUNDING FIRE & KEEP CYLINDERS COOL USING A WATER SPRAY APPLIED FROM THE(SUPP DATA)
Extinguishing Media:
TO EXTING A VINYL CHLORIDE FIRE STOP THE FLOW OF GAS. IF THE FLOW CANNOT BE STOPPED, LET THE FIRE BURN ITSELF(SUPP DATA)
Flash Point: Flash Point Text: N/K
Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 4%
Upper Limit(s): 22%

Section 6 - Accidental Release Measures
VINYL CHLORIDE

Spill Release Procedures:
EVACUATE AREA. PERSONNEL EQUIPPED W/SPECIAL PERSONAL PROTECTIVE SUITS FOR FIRE/CHEMICALS AND POSITIVE PRESSURE NIOSH/MSHA APPROVED SCBA CAN RE-ENTER THE AREA AND ATTEMPT TO STOP LEAK.

Section 7 - Handling and Storage
VINYL CHLORIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
VINYL CHLORIDE

Repiratory Protection:
NIOSH/MSHA APPROVED POSITIVE PRESSURE SCBA SHOULD BE WORN IF IT IS SUSPECTED THAT VINYL CHLORIDE IS IN THE AIR.
Ventilation:
NONE SPECIFIED BY MANUFACTURER.
Protective Gloves:
IMPERVIOUS GLOVES.
Eye Protection: CHEM WORK GOGG/FULL LENGTH FSHLD (FP N).
Other Protective Equipment: EYE WASH STATIONS & SAFETY SHOWERS READILY AVAILABE.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXTING MEDIA:OUT WHILE COOLING CYLINDER & SURROUNDINGS USING A H*2O SPRAY. EXPLO HAZ:MAX POSS DISTANCE. FLAMM & TOX GASES MAY SPREAD FROM A SPILL AFTER FIRE IS EXTING & BE SUBJECT TO REIGNIT. THERMAL DECOMP PRODS MAY INCL HCL & PHOSGENE (FP N). OTHER PREC: PLAN COVERING STEPS TO BE TAKEN IN CASE OF ACCIDENTAL RELEASE.

Section 9 - Physical & Chemical Properties
VINYL CHLORIDE

HCC: G2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 7.2F,-13.8C
Melting/Freezing Point: Melting/Freezing Text: -245F,-154C

Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 234KPA@21C **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 2.21
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: 1.07 CM3/1 ML H*2O
Appearance and Odor: COLORLESS, HIGHLY FLAMM GAS WITH A PLEASANT, SWEET ODOR AT HIGH CONC.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
VINYL CHLORIDE

Stability Indicator: YES
Materials to Avoid:
OXIDIZING MATLS, ACTIVE METALS, ALUMINUM ALLOYS AND ORGANOMETALLICS.
Stability Condition to Avoid:
AVOID EXPOSURE TO SUNLIGHT, HEAT, AIR, OXYGEN PEROXIDES AND OTHER STRONG OXIDIZING AGENTS.
Hazardous Decomposition Products:
HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE.
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
OXYGEN (AIR), HEAT, SUNLIGHT, MOISTURE AND FREE RADICAL INITIATORS OR OTHER CATALYTIC MATERIALS.

Section 11 - Toxicological Information
VINYL CHLORIDE

Toxicological Information: N/P

Section 12 - Ecological Information
VINYL CHLORIDE

Ecological Information: N/P

Section 13 - Disposal Considerations
VINYL CHLORIDE

Waste Disposal Methods:
DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
VINYL CHLORIDE

Transport Information: N/P

Section 15 - Regulatory Information
VINYL CHLORIDE

SARA Title III Information: N/P
Federal Regulatory Information: N/P
State Regulatory Information: N/P

Section 16 - Other Information
VINYL CHLORIDE

Other Information: N/P

HMIS Transportation Information

Product Identification: VINYL CHLORIDE
Transporation ID Number: 39375
Responsible Party CAGE: 0FB11
Date MSDS Prepared: 10/01/1985
Date MSDS Reviewed: 03/24/1993
MFN: 03/24/1993
Submitter: N TN
Status Code: C
Container Information
- **Unit of Issue:** NK
- **Container Quantity:** NK
- **Type of Container:**
- **Net Unit Weight:**

Article without MSDS: N

Department of Transportation Information

DOT Proper Shipping Name: VINYL CHLORIDE, INHIBITED OR VINYL CHLORIDE, STABILIZED
DOT PSN Code: PRS
Symbols:
DOT PSN Modifier:
Hazard Class: 2.1
UN ID Number: UN1086
DOT Packaging Group:
Label: FLAMMABLE GAS

Special Provision(s): 21,B44
Packaging Exception: 306
Non Bulk Packaging: 304
Bulk Packaging: 314,315
Maximimum Quantity in Passenger Area: FORBIDDEN
Maximimum Quantity in Cargo Area: 150 KG
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: VINYL CHLORIDE, INHIBITED
IMO PSN Code: PJJ
IMO PSN Modifier:
IMDG Page Number: 2186
UN Number: 1086
UN Hazard Class: 2(2.1)
IMO Packaging Group: -
Subsidiary Risk Label: -
EMS Number: 2-07
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: VINYL CHLORIDE, INHIBITED
IATA PSN Code: ZHW
IATA PSN Modifier:
IATA UN Id Number: 1086
IATA UN Class: 2.1
Subsidiary Risk Class:
UN Packaging Group:
IATA Label: FLAMMABLE GAS
Packaging Note for Passengers: FORB
Maximum Quantity for Passengers: FORB
Packaging Note for Cargo: 200
Maximum Quantity for Cargo: 150KG
Exceptions: A1

AFI Detail Information

AFI Proper Shipping Name: VINYL CHLORIDE, INHIBITED
AFI Symbols:
AFI PSN Code: ZHW
AFI PSN Modifier:
AFI UN Id Number: UN1086
AFI Hazard Class: 2.1
AFI Packing Group: N/A
AFI Label:
Special Provisions: P4
Back Pack Reference: A6.3, A6.5

HAZCOM Label Information

Product Identification: VINYL CHLORIDE
CAGE: 0FB11
Assigned Individual: N
Company Name: MATHESON GAS PRODUCTS
Company PO Box:
Company Street Address1: 30 SEAFIEW DRIVE
Company Street Address2: SEACAUCUS, NJ 07096 US
Health Emergency Telephone: 201-933-2400
Label Required Indicator: Y
Date Label Reviewed: 10/08/1992
Status Code: C
Manufacturer's Label Number:
Date of Label: 10/08/1992
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Severe
Reactivity Hazard: Slight

Association of
Bay Area Governments

ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Michael Rose

has successfully completed the course titled

OSHA 8-hr Annual HAZWOPER Refresher

Satisfies 29 CFR 1910.120(e)(8)

on

October 12, 2004

and has earned

IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No. 39611
(verify at www.hazmatschool.com)

Terry Bursztynsky, Training Director
Sharon McCreadie, Training Coordinator
www.abag.ca.gov; (510) 464-7964

Paul W. Gantt, REA
Safety Compliance Management, Inc.

Association of
Bay Area Governments

ABAG Training Center
www.hazmatschool.com

CERTIFICATE OF COMPLETION

Michael Rose

has successfully completed the course titled

OSHA 8-hr Training for Supervisors

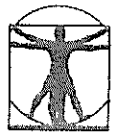
Satisfies 29 CFR 1910.120(e)(4)
on
June 20, 2005

and has earned
IACET authorized 0.8 CEUs (Continuing Education Units) from the program

Certificate No. 43867
(verify at www.hazmatschool.com)

Terry Bursztynsky, Training Director
Sharon McCreadie, Training Coordinator
www.abag.ca.gov; (510) 464-7964

Paul W. Gantt, REA
Safety Compliance Management, Inc.



HST

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

David E. Egan

has successfully completed 40 hours of instruction in

WASTE SITE WORKER PROTECTION

Prepared and conducted by
Hygiene, Safety and Training Inc.
to comply with OSHA 1910.120(e)(2)

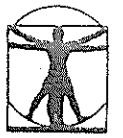
Jack M. Peterson

Jack M. Peterson
CSP, CIH

November 10, 1989

Date of Completion

LITHO IN U.S.A.



HST

CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

David E. Egan

has successfully completed 8 hours of instruction in

SUPERVISORY TRAINING

Prepared and conducted by
Hygiene, Safety and Training Inc.
to comply with OSHA 1910.120(e)(3)

Jack M. Peterson

Jack M. Peterson
CSP, CIH

November 10, 1989

Date of Completion

Shaw® Shaw Environmental & Infrastructure, Inc.

CERTIFICATE *of* COMPLETION

Presented To

David E. Egan

In Recognition of Having Successfully Completed the Prescribed Course of Study For

Hazwoper 8-Hour Refresher (Online)

OSHA 29 CFR 1910

I certify that the above trainee has completed this training course as given by Shaw E&I or one of its subsidiaries.

12/17/2003

EFFECTIVE DATE

Don L. Unruh

DON L. UNRUH, CIH, CSP
Manager, Internal Training Group

THE NATIONAL

ENVIRONMENTAL TRAINERS

certify that

Rory Wint

has satisfactorily passed an exam and completed a 40 hour training course entitled

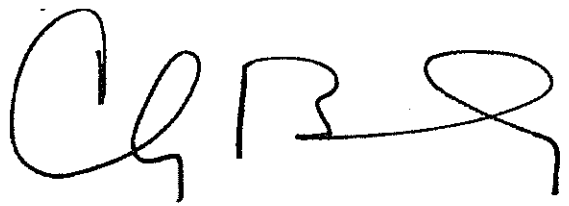
"Hazardous Waste Operations and Emergency Response"

meeting the requirements identified in Title 29 CFR 1910.120. This course is eligible for 3.33 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

NATIONAL ENVIRONMENTAL TRAINERS

November 24, 2004

Signature of Instructor



Clay Bednarz, MS, CHMM (No. 3482)

THE NATIONAL

ENVIRONMENTAL TRAINERS

certify that

Frank Schiano

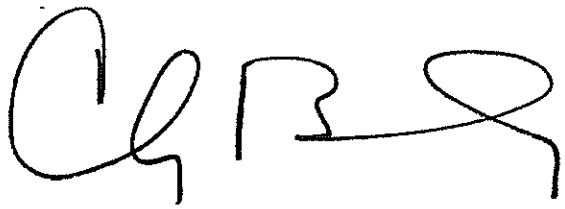
has satisfactorily passed an exam and completed a 40 hour training course entitled

"Hazardous Waste Operations and Emergency Response"

meeting the requirements identified in Title 29 CFR 1910.120. This course is eligible for 3.33 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

Signature of Instructor

NATIONAL ENVIRONMENTAL TRAINERS



December 5, 2004

Clay Bednarz, MS, CHMM (No. 3482)

THE NATIONAL ENVIRONMENTAL TRAINERS

certify that

Jason Hammond

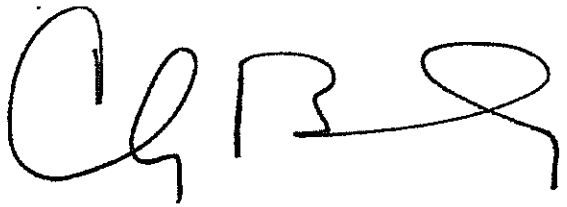
has satisfactorily passed an exam and completed a 40 hour training course entitled

"Hazardous Waste Operations and Emergency Response"

meeting the requirements identified in Title 29 CFR 1910.120. This course is eligible for 3.33 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

Signature of Instructor

NATIONAL ENVIRONMENTAL TRAINERS



October 3, 2005

Clay A. Bednarz, MS, RPIH

THE NATIONAL

ENVIRONMENTAL TRAINERS

certify that

Luciano Ribeiro

has satisfactorily passed an exam and completed an 8-hour annual refresher training course entitled

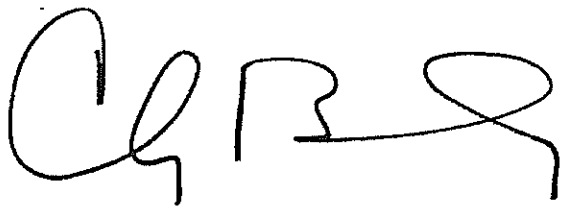
"Hazardous Waste Operations and Emergency Response"

meeting the requirements identified in Title 29 CFR 1910.120. This course has been awarded 1.0 Industrial Hygiene CM Points by the American Board of Industrial Hygiene-Approval Number 13334. This course is also eligible for .66 Continuance of Certification (COC) points from the Board of Certified Safety Professionals.

NET
NATIONAL ENVIRONMENTAL TRAINERS

September 29, 2005

Signature of Instructor



Clay A. Bednarz, MS, RPIH

DEMO/LINE BREAKING PROCEDURE

■ 5/22/04 ■ Revision 0

1 PURPOSE AND SCOPE

This procedure provides the minimum requirements for creating and maintaining safe operations.

This procedure applies to all RC&D personnel and subcontractors working on projects where pipe demo and line breaking safety requirements are applicable.

2 REFERENCES

Title 29, Code of Federal Regulations, Parts 1910 and 1926, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

3 APPENDIXES

- Appendix A, Line Breaking Permit
- Appendix B, Pipe Demo Checklist

4 GENERAL

■ **Definitions**

- **Blank / Blind Flange** - the solid plate or "cap" which completely covers the bore of a pipe, line, etc. The blank / blind must absolutely close the line, pipe, etc., must be capable of withstanding the maximum upstream pressure and be fabricated from compatible materials.

- **Double Block and Bleed** - two locked and tagged closed valves with a locked and tagged open drain or vent between them.
- **Energy Isolating Device** - a mechanical device that physically prevents the transmission or release of energy including, but not limited to, the following: A manually operated electrical circuit breaker, a disconnect switch; a manually operated switch by which the conductors or a circuit can be disconnected from all ungrounded supply conductors and, in addition, no pole can be operated independently; a slide gate; a slip blind; a line valve; a block; and any similar device used to block or isolate energy. The term does not include a push button, selector switch or other control circuit type devices.

- **Equipment Isolation Log** - the form used to identify the equipment, work to be done, energy sources, locks and tags applied and those giving the authorization. It may serve as the individual, job specific Lockout / Tagout Procedure.

- **Equipment Owner** - the Department in whose area the work is being performed. Note: This is usually the department responsible for operation or use of the equipment.

- **Hot Work** - any work such as welding, burning, cutting, grinding or other activity that could act as a source of ignition.

- **Normal Production Operations** - the utilization of a machine or equipment to perform its intended production function.

- **Slip Blind** - a metal disc with a short handle which is used to block the flow of material in a pipe. It is to be slipped between two flanges and bolted in place.

■ **Responsibilities**

- The *Manager/Supervisor* is responsible for implementing and enforcing this procedure.
- The *Safety Representative* is responsible for monitoring compliance with this procedure.
- The *Site Supervisor/Engineer,* who initiates/directs work, is responsible for ensuring the following:
  - All workers have been educated in the hazards associated with the specific demo or line breaking operation.
  - All workers have been trained in the proper use of all personal protective equipment being used or required.
  - Reviewing the isolation and line entry plan or SOP's developed by the Project Manager or Equipment Owner, then visually inspecting the work site ensuring all isolation valves are closed, confirming locks and tags are applied to all isolation and drain valves in accordance with Lockout / Tagout procedure and ensuring drain and vent valves are secured in the open position.
  - Determining the location of the nearest safety shower and eye wash station and checking its operation.
  - Reviewing the entry permit with the Project Manager or Equipment Owner. If any concerns arise they must be resolved prior to signing the permit.
  - Obtaining the personal protective equipment specified on the Line Entry Permit.
  - Assuring the workers have the current training for the specific equipment to be used.
  - Assuring workers are physically capable of using the equipment.
  - Signing the permit and returning it to the Project Manager or Equipment Owner for posting at the work site.
  - Upon completion of the work, verifying that the work area has been left in a safe, clean condition and that craftspersons have signed off the permit.
- The *Employees / Craftspersons* performing the work are responsible for:
  - Reviewing and signing the Line Entry Permit and Equipment Isolation Log prior to beginning work. If there is any question concerning the safety of the plan, the issue(s) must be resolved prior to starting work.
    - Placing their personal locks and tags on all required locations.

- Inspecting and testing all Personal Protective Equipment. Ensuring defective personal protective equipment is not used and reporting any discrepancies to the supervisor.
- Determining the location of the nearest safety shower and eye wash station and checking its operation.
- Treating any line or piece of equipment as full, under pressure or containing product. Requiring that the following actions be taken for any breaking activity:
- Assuring there is a free and clear escape route from the work location.
- Performing a review of the system to be isolated. The review should include a field and document review to determine the following:
  a. Line content
  b. Direction of flow
  c. Isolation points near to the work site
  d. Pressure release points
  e. Low point drains & high point vents
  f. Determine any lock out requirement that may apply
  g. Fill out and sign any permits required
  h. Plan for any spillage that may occur
  i. Determine any barricading or area protection required
  j. Determine the required personal protective equipment for performing the line entry
  k. Developing a formal Equipment Isolation Log based on the system information.
  l. Directing area personnel to close all isolation valves and open all vents and drain valves, prepare the equipment in accordance with the plan and apply "DO NOT OPERATE" Tags and any required locks in accordance with the RC&D Lockout / Tagout Procedure
  m. Performing an inspection of the system to be opened or entered and completing the Equipment Isolation Log and Line Entry Permit with special emphasis given to "Methods of Isolation" and "Personal Protective Equipment."
  n. Discussing the potential hazards with

each supervisor of personnel who will be performing the entry into the system.

o. Signing and issuing the permit to the supervisor of personnel performing the work.

5 PROCEDURE

Identify and mark the lines or process equipment to be opened, the work to be done and any hazardous materials that may be involved. An MSDS must be available and kept at the jobsite when working with known hazardous chemicals.

- Shut down and depressure the equipment according to Standard Operating Procedures (SOP's).
- Drain, vent and / or purge and prepare the equipment as per the equipment specific SOP's.
- Assuring any spill recovery and safety equipment required by the plan is available for use.
- Providing containment for liquids and solids that may still be in the system.
- Determine how the equipment can be isolated, locked and tagged. Isolations of the line or process equipment should be done as close to the work area as possible.
- Complete the job specific Equipment Isolation Log, noting how the equipment has been isolated, locked and tagged.
- Implement the lockout / tagout procedure.
- Verify equipment isolation and lockout / tagout. Rod out any drains or bleed valves to assure they are not blocked or plugged.
- Select and inspect the PPE. Take defective PPE out of service.
- Inspect the area above, below and adjacent to the work area (at least 35 feet in all directions) for any potential hazards, people, equipment or operations that could adversely affect the work to be performed or could be adversely affected by the work. Take the appropriate precautions (i.e., barricade the area, cover equipment and cable trays, stop all hot work, etc.)
- Locate and verify accessibility and operation of all area safety equipment (i.e., safety showers, potable water, SCBAs, fire detection and suppression equipment, etc.)
- Complete the Line Entry Permit review it with craftspersons that will perform the work and post the permit at the work site but only after it has been signed by all appropriate personnel.
- Loosen only one bolt at a time starting with the bolt down and away from the workers. Be prepared for a sudden

release of the piping content and be prepared to re-tighten the flange if necessary.

- Do not remove the required PPE until it is certain the line is completely drained and vented. Lines will sometimes "burp" several minutes after the line is opened.

- Install any required blinds or blank flanges. Blinds must be of the correct materials of construction and pressure rating. Pressure ratings for blanks and blinds must be equal to or greater than the pipe / equipment pressure rating. Nuts and bolts must also be of the correct materials of construction, temperature rating and tensile strength. Gaskets required for the job must be of the correct size and materials of construction.

- When installing blanks or blinds, install all the required bolts / studs and nuts and torque them according to the job specific SOP.

- Upon completion of the job, clean up the work area, notify the maintenance supervisor, sign off and return the permit, remove personal locks and tags and sign off the Equipment Isolation Log.

DEMO/LINE BREAKING

■ 5/22/04 ■ Revision 0

LINE ENTRY

Valid from _____ to _____, _____ Equipment Isolation Log No._____
(am/pm) (am/pm) DATE

1. Work Description
Equipment Location or Area _____
Work to be

2. Gas Test

☐ None Required			
☐ Instrument Check	Test Results	Other Tests	Test Results
☐ Oxygen 20.8%			
☐ Combustible %			

Gas Tester Signature Date

3. Special Instructions: ☐ None ☐ Check with issuer before beginning work

4. Hazardous Materials ☐ None What did the line / equipment last contain?

5. Personal Protection ☐ Standard Equipment: splash proof suit - coat and rubber gloves and boots; faceshield

☐ Respirator ☐ Standby Person ☐ Chemical Proof

☐ Other, specify:_____

6. Fire Protection ☐ None Required ☐ Portable Fire Extinguisher

☐ Fire Watch ☐ Other, specify: _____

7. Condition of Area and Equipment

Required		THESE KEY POINTS MUST BE CHECKED
		a. Isolation valves closed and
		b. Vents or bleeders opened, checked and tagged?
		c. Lines drained, washed, purged, steamed or otherwise cleared and
		d. Adjoining equip. & operations checked to have any effect on the
		e. Non-sparking tools
		f. Immediate area and/or area under the work barricaded or roped
		g. Provisions made to contain or collect any spilled

Comments

Line Entry Permit

8. Approval	Permit Authorization			Permit Acceptance		
	Area Supv.	Date	Time	Maint.Supv./Engineer Contractor Supv.	Date	Time
Issued by						
Endorsed by						
Endorsed by						

9. Individual Review

I have been Instructed on proper Line Entry Procedures

	Signed	Signed
Persons Authorized to Enter the Line	_____	_____
	_____	_____
	_____	_____
	_____	_____
Standby Man	_____	_____

10. Job Completion

☐ Yes ☐ No Is the work on equipment complete?

☐ Yes ☐ Has the worksite been cleaned and made safe?

Workman answering above questions _____

Issuer's Acceptance _____

Retain for project files.

Pipe Demolition Checklist

Demolition Procedure

As part of the construction activities, pipe demolition will occur. Prior to demolition, all pipes must be cleaned and drained by plant operations and identified preferably using paint to mark the lines to be demoed. The pipeline demo procedure checklist must be attached to the JSA and work permit. The following procedure and checklist has been adopted for the safe demolition of piping. Each item must be completed and answered yes before line cutting is to commence.

Pipe Demo Procedure Checklist

(This form to be attached to JSA and work permit)

1 Has pipe been properly de-energized, flushed, drained and depressurized?
- _____a. Proper valves are blocked and/or blinded
- _____b. Vent and drain valves opened
- _____c. Is energy source properly locked and tagged

2 Has pipe been identified and cut points marked?
- _____a. Pipe line identified by plant operations
- _____b. Cut points marked
- _____c. Operations supervisor has verified line and cut points

3 Are all cut points safe?
- _____a. Travel of blade around pipe/clear of obstructions (other pipe conduit, etc.)
- _____b. Is pipe secure or unable to move when cut
- _____c. Have preparations been made for spill containment
- _____d. Permit type – identifies cutting tool to be used, example: cold cut (air powered saw); hot cut (torch, port-a-band)

4. Is there safe and adequate egress at the cut points?
- _____a. Egress required every 40 feet

5. Have all tools been properly inspected?
- _____a. Are cutting tools in good working condition?
- _____b. Is air hose in good condition, properly connected, connections pinned properly?

6. Are all personnel wearing proper PPE?
- _____a. Face shield and goggles when cutting
- _____b. Fall protection if over 6' above working platform
- _____c. Shoring or sloping adequate if below grade
- _____d. Any additional P.P.E. required by permit has been inspected and is in good condition?

7. Have all required personnel been notified before initial cut?
- _____a. Operations Supervisor
- _____b. Shaw Superintendent
- _____c. Shaw Supervisor (G.F.)
- _____d. Shaw Foreman

_____ Name

_____ Date

EXCAVATION

■ 5/22/04 ■ Revision 0

1 PURPOSE AND SCOPE

This procedure provides the minimum requirements for creating and maintaining safe excavation operations, including hand digging and some concrete breaking operations.

This procedure applies to all RC&D personnel and subcontractors working on projects where excavation safety requirements are applicable.

2 REFERENCES

Title 29, Code of Federal Regulations, Parts 1910 and 1926, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

3 APPENDIXES

- Appendix A, Soil Classification
- Appendix B, Sloping and Benching
- Appendix C, Timber Shoring for Trenches
- Appendix D, Aluminum Hydraulic Shoring for Trenches
- Appendix E, Excavation Permit

4 GENERAL

This procedure applies to all excavations with special emphasis placed on energized utilities, where there is a possibility for the excavating equipment and/or tools to come into contact with such utilities because the exact location and/or depth of the utilities has not been determined. The same application of this procedure is to be followed when breaking into concrete floors, walls, or ceilings, at or in the immediate vicinity where utilities are encased.

The primary hazards associated with excavations are the potential for cave-ins and the accidental contact or displacement of existing underground installations, with the accompanying risk potential of personal injury and/or property damage.

The Manager/Supervisor in charge of the work shall determine, in accordance with this procedure, what steps are necessary to ensure a safe excavation. An *Excavation Permit* shall be completed by the Supervisor/Competent Person in charge of the work prior to the start of any excavation work. A review of soil conditions should be a prime factor in determining whether to shore, slope, or shield the excavation. A soil analysis, along with a study of flood levels and tidal changes, will also be a factor in determining potential water hazards and the need for dewatering systems.

■ Definitions

- *Accepted Engineering Practices* - Those requirements which are compatible with standards of practice required by a registered professional engineer.
- *Aluminum Hydraulic Shoring* - A pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (walers). Such system is designed to support the sidewalls of an excavation and prevent cave-ins.
- *Bell-bottom Pier Hole* - A type of shaft or footing excavation, the bottom of which is made larger than

the cross section above to form a belled shape.

- *Benching* (Benching System) - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- *Cave-in* - The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.
- *Competent Person* - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- *Cross Braces* - The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.
- *Excavation* - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- *Faces or Sides* - The vertical or inclined earth surfaces formed as a result of excavation work.
- *Failure* - The breakage, displacement, or permanent deformation of a structural member or connection to reduce its structural integrity and its supportive capabilities.
- *Hazardous Atmosphere* - An atmosphere which, by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.
- *Kickout* - The accidental release or failure of a shore or cross brace.
- *Protective System* - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- *Ramp* - An inclined walking or working surface that is used to gain access to one point from another and is constructed from earth or from structural material such as steel or wood.
- *Registered Professional Engineer* - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer registered in any state is deemed to be

a "registered professional engineer" within the meaning of this procedure when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

- *Sheeting* - The members of a shoring system that retain the earth in position and, in turn, are supported by other members of the shoring system.
- *Shield (Shield System)* - A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- *Shoring (Shoring System)* - A structure, such as a metal, hydraulic, mechanical, or timber shoring system, that supports the sides of an excavation and which is designed to prevent cave-ins.
- *Sloping (Sloping System)* - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- *Stable Rock* - Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material is secured against caving in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.
- *Structural Ramp* - A ramp built of steel or wood, which is usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.
- *Support Systems* - A structure such as underpinning, bracing, or shoring which provides support to an adjacent structure, underground installations, or the sides of an excavation.
- *Tabulated Data* - Tables and charts approved by a registered professional engineer and used to design and construct a protective system.
- *Trench (Trench Excavation)* - A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

- *Trench Box* - See "Shield."
- *Trench Shield* - See "Shield."
- *Uprights* - The vertical members of a trench shoring system placed in contact with the earth and usually positioned so that members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."
- *Wales* - Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

■ **Responsibilities**

- The *Manager/Supervisor* is responsible for implementing and enforcing this procedure.
- The *Safety Representative* is responsible for monitoring compliance with this procedure.
- The *Site Supervisor/Engineer,* who initiates/directs the excavation work, is responsible for ensuring the following:
  - — All workers have been educated in the hazards associated with the specific excavation.
  - — All workers have been trained in the proper use of all personal protective equipment being used or required at the excavation site.
  - — All preparatory work is conducted as set forth by this procedure before any worker enters the excavation.
  - — Excavation work is performed as required by this procedure.
  - — An Excavation Permit has been issued and properly completed by all necessary personnel.
- The *Competent Person* is responsible for completing the Excavation Permit and ensuring the following:
  - — Performing inspections prior to the start of "each shift" as needed throughout the shift to ensure a safe operation.
  - — Removing employees from the hazardous area when there is evidence of a possible cave-in.
  - — Identifying and correcting hazards associated with the excavation.

5 PROCEDURE

The minimum requirements of this procedure, as set forth in the 29CFR 1926.650-652 Construction Excavation Standards by the Federal Occupational Safety and Health Administration (OSHA), are quite extensive and therefore must be reviewed thoroughly by those responsible for enforcement, administration, monitoring, and implementation prior to commencement of any work task involving excavation.

■ **Surface Encumbrances**

Ensure that all surface encumbrances, located so as to create a hazard to employees or become subject to physical damage, are removed, supported, or

neutralized, as necessary, prior to the start of any excavation work.

■ **Underground Installations**

- When it is necessary to excavate, drill, or break into ground, floors, walls, or other locations where utility installations may exist, the supervisor in charge of the work shall be responsible for reviewing all existing drawings and prints for the location of such lines.
- Utility companies or owners shall be contacted within established or customary local response time, advised of proposed work, and asked to establish the exact location of the underground utility installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local statute), or cannot establish the exact location of existing installations, the Site Supervisor may direct the work to proceed, provided effort is made to do so with caution and provided detection equipment or other acceptable means to locate utility installations are used.
- Determine the estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, gas lines, or any other underground installation that may be expected to be encountered during excavation, prior to opening an excavation. Grade stakes and reference markers shall be placed for positive location of the area to be excavated and depth requirements.
- When excavation operations approach the estimated location of underground installations, the exact location of the installation shall be determined by safe and acceptable means. It will be the responsibility of the Site Supervisor in charge of the work to determine what special precautions should be taken to ensure the safety of employees and property.
- Energized lines shall be located by manual digging when there is a possibility of damaging them with mechanical excavation equipment. Some of the lines encountered may have to be locked and tagged out for employee safety. Tools and equipment may have to be grounded and insulation provided for employees when electrical exposure is possible. Should the work involve the excavation of an area to uncover a gas leak, good ventilation and the use of nonsparking tools shall be required.
- While an excavation is open, all underground installations shall be protected, supported, or removed, as necessary, to safeguard employees and adequately protect the installations from damage.

■ **Access and Egress**

- A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are 4 feet or

more in depth so that no more than 25 feet of lateral travel is required for employees.

- Structural ramps that are used solely by employees as a means of access or egress from excavation shall be designed by a Competent Person.
- Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design and shall be constructed in accordance with the design.
- Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.
- Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.
- Structural members used for ramps and runways shall be of uniform thickness. Cleats or other appropriate means used to connect runway structural members shall be attached in a manner to prevent tripping.

■ **Exposure to Vehicular Traffic**

All employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

■ **Exposure to Aboveground Electrical Systems**

Unless deenergized and visibly grounded or provided with an effective insulating barrier, heavy equipment, tools, or individuals shall not operate/work within 10 feet (minimum distance - refer to 29 CFR 1926.550 (a) (15) of any power line or exposed electrical distribution component.

■ **Exposure to Falling Loads**

Employees shall not be permitted to be underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

■ **Warning Systems for Mobile Equipment**

When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system, such as barricades, hand or mechanical signals, or stop logs, shall be utilized. Where possible, the grade should be away from the excavation.

■ **Hazardous Atmospheres**

To prevent employee exposure to harmful levels of atmospheric contaminants and to ensure acceptable atmospheric conditions within excavations, the following requirements shall be met:

- Prior to allowing employees to enter an excavation where oxygen

deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, such as in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in excavations greater than 4 feet in depth shall be tested.

- It shall be ascertained by air sampling performed by a competent person that the atmospheres in the excavations contain an adequate quantity of oxygen and that harmful contaminants have been diluted to safe concentrations prior to, and periodically during, occupancy.
- The acceptable oxygen concentration range for excavation entry is 20.5-23.5 percent.
- The concentration of flammable gases or vapors shall be less than 10 percent of the lower explosive limit (LEL).
- Tests for toxic substances shall be made whenever there is a possibility that the excavation contains or may have contained a toxic substance. Test results shall be within the limits established by OSHA's permissible exposure level (PEL) or ACGIH-TLVs.
- If any test conducted indicates that the atmosphere is unsafe, before any employee is permitted to enter the excavation, the space shall be ventilated until the concentration of hazardous substance is reduced to a safe level or removed. Ventilation shall be continued as long as recurrence of the hazard is probable.
- Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.
- Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

■ **Protection from Water Accumulation**

- Employees shall not work in excavations in which there is accumulated water or in excavations in which water is accumulating unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.
- If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations

shall be monitored by the supervisor or engineer designated as the competent person to ensure proper operation.

- Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains require an inspection by the supervisor or engineer designated as the competent person.

■ **Stability of Adjacent Structures**

- Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems shall be provided, such as shoring, bracing, or underpinning to ensure the stability of such structures.
- Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be done unless:
  - — A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or
  - — The excavation is in stable rock; or
  - — A registered professional engineer has determined that the structure is sufficiently removed from the excavation so that it will be unaffected by the excavation activity; or
  - — A registered professional engineer has determined that such excavation work will not pose a hazard to employees.
- Sidewalks, pavements and appurtenant structures shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures. The support system shall be capable of withstanding a minimum live load of 125 lb/ft.

■ **Protection of Employees from Loose Rock or Soil**

- Employees shall be adequately protected from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material, installing protective barricades at intervals as necessary on the face to stop and contain falling material, or providing other means of equivalent protection.
- Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such material or equipment a minimum of 2 feet from the edge of excavations, by the use of retaining devices that are sufficient to prevent materials or equipment from

falling or rolling into excavations, or by a combination of both if necessary.

■ **Inspections**

- The individual designated as the Competent Person shall conduct daily inspections of excavations, the adjacent areas, and protective systems for evidence of possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- An inspection shall be conducted by the Competent Person prior to the start of "each shift" and as needed throughout the shift to ensure a safe operation. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence.
- Where the Competent Person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.
- Workers shall be adequately instructed to immediately report any signs or indications of weakness in shoring, sloping, or soil stability to responsible supervision.

■ **Fall Protection**

- Where equipment or employees are required or permitted to cross over excavations, RC&D shall provide walkways or bridges with standard guardrails. Where the potential exists for exposed ends of a walkway or bridge to create a tripping hazard, it shall be appropriately provided with beveled cleating. Additionally, the walkway or bridge shall have a safety factor of at least four times the intended load.
- Adequate barrier physical protection shall be provided at all remotely located excavations. All wells, pits, shafts, etc., shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, etc., shall be backfilled.
- Where workers are employed adjacent to an excavation on work other than that directly involving the excavation, protection such as standard guardrails (or equivalent protection) shall be provided to eliminate the potential of fall exposure.

■ **Protection of Employees**

Each employee shall be protected in an excavation from cave-in by an adequate protective system designed in accordance with this procedure except when excavations are made entirely in stable rock; or excavations are less than 5 feet in depth and examination of the ground by the supervisor or engineer designated as the competent person provides no indication of a potential cave-in.

Protective systems shall have the capacity to resist without failure all loads that are

intended or could reasonably be expected to be applied or transmitted to the system.

■ **Design of Sloping and Benching Systems**

The slopes and configurations of sloping and benching systems shall be selected and constructed in accordance with one of the following options:

- *Option 1* - If no attempt is made to determine soil type, excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal). This angle represents the worst soil condition (Type C) and therefore requires the use of configurations that are in accordance with the slopes shown for Type C soil in Appendix B of this procedure.
- *Option 2* - Maximum allowable slopes and allowable configurations for sloping and benching systems shall be determined in accordance with the conditions and requirements set forth in Appendices A and B of this procedure.
- *Option 3* - Design of sloping or benching systems shall be selected from and be in accordance with tabulated data. The tabulated data shall be in written form and shall include all of the following:
  - — Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.
  - — Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe.
  - — Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

  A copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction and use of the protective system.
- *Option 4* - Sloping and benching systems not utilizing Options 1, 2, or 3 above shall be approved by a registered professional engineer. All such designs shall be in written form and include the following:
  - — The magnitude of the slopes that were determined to be safe for the particular project.
  - — The configurations that were determined to be safe for the particular project.
  - — The identity of the registered professional engineer approving the design.

  A copy of the design shall be maintained at the jobsite during construction and use of the system.

■ **Design of Support Systems, Shield Systems, and Other Protective Systems**

Design of support systems, shield systems, and other protective systems

shall be selected and constructed in accordance with one of the following options:

- *Option 1* - Design of timber shoring in trenches shall be in accordance with the conditions and requirements set forth in Appendices A and C. Designs for aluminum hydraulic shoring shall be in accordance with Appendix D if the provisions of Option 2 cannot be met.
- *Option 2* - Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer. Deviations shall only be allowed after the manufacturer issues specific written approval. All information pertaining to the design shall be in written form at the jobsite during construction and use of the protective system.
- *Option 3* - Design of support systems, shield systems, or other protective systems using tabulated data shall be in written form and shall include the following:
  - — Identification of the parameters that affect the selection of a sloping or benching system drawn from such data.
  - — Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe.
  - — Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

  A copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction and use of the protective system.
- *Option 4* - Design of support systems, shield systems, or other protective systems not utilizing Option 1, 2, or 3 above shall be approved by a registered professional engineer. All designs shall be in written form and include the following:
  - — A plan indicating the sizes, types, and configurations of the materials to be used in the protective system.
  - — The identity of the registered professional engineer approving the design.

  A copy of the design shall be maintained at the jobsite during construction and use of the protective system.

■ **Materials and Equipment**

- Ensure that all materials and equipment used for protective systems are free from damage or defects that might impair their proper function.
- Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the

recommendations of the manufacturer and in a manner that will prevent employee exposure to hazards.

- Any materials or equipment that are damaged will be assessed by the supervisor or engineer designated as the competent person as to its suitability for continued use.

■ **Installation and Removal of Supports**

- Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.
- Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.
- Individual members of support systems shall not be subjected to loads exceeding their designed capacity.
- Before removal of individual members begins, the need for additional precautionary measures to ensure the safety of employees shall be evaluated by a competent person. Such measures may include the installation of other structural members to carry the loads imposed on the support system.
- Removal operations shall begin at, and progress from the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members or possible cave-in of the sides of the excavation.
- Backfilling shall progress together with the removal of support systems from excavations.

■ **Additional Requirements for Support Systems for Trench Excavations**

- The depth of trench excavations may extend to a maximum of 2 feet below the bottom of the members of a support system, provided the system is designed to resist the forces calculated for the full depth of the trench and there are no indications, while the trench is open, of a possible loss of soil from behind or below the bottom of the support system.
- Installation of support systems shall be closely coordinated with the excavation of trenches.
- Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees unless employees at the lower levels are protected from the hazards of falling, rolling, or sliding material or equipment.

■ **Shield Systems**

- Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

- Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.
- Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.
- Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.
- The depth of trench excavations may extend to a maximum of 2 feet below the bottom of a shield, provided the shield is designed to resist the forces calculated for the full depth of the trench and there are no indications, while the trench is open, of a possible loss of soil from behind or below the bottom of the shield.

SOIL CLASSIFICATION

1.0 SCOPE

This appendix describes a method of classifying soil and rock deposits based on site and environmental conditions and on the structure and composition of earth deposits. Contained herein are definitions, set forth requirements, and acceptable visual and manual tests for use in classifying soils.

Classification of soil by a competent person is a prerequisite to designing protective systems for excavations.

2.0 DEFINITIONS

Cemented Soil - A soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

Cohesive Soil - Clay (fine grained soil) or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry and exhibits significant cohesion when submerged. Examples include clayey silt, sandy clay, silty clay, clay, and organic clay.

Dry Soil - Soil that does not exhibit visible signs of moisture content.

Fissured - A soil material that has a tendency to break along definite planes of fracture with little resistance or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

Granular Soil - Gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

Layered System - Two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

Moist Soil - A condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

Plastic - A property of a soil which allows the soil to be deformed or molded without cracking or appreciable volume change.

Saturated Soil - A soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or Torvane shear device.

Soil Classification (for the proper use of this procedure) - A method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure.

Stable Rock - Natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Submerged Soil - Soil which is underwater or is free-seeping.

Type A - Cohesive soil with an unconfined compressive strength of 1.5 tons per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are clay, silty clay, sandy clay, clay loam, and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

1. The soil is fissured.
2. The soil is subject to vibration from heavy traffic, pile driving, or similar effects.
3. The soil has been previously disturbed.
4. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater.
5. The material is subject to other factors that would require it to be classified as a less stable material.

Type B - Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf, or:

1. Granular, cohesionless soils, including angular gravel, silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam.
2. Previously disturbed soil, except those which would otherwise be classed as Type C soil.
3. Soil that meets the unconfined compressive strength or requirements of Type A, but is fissured or subject to vibration.
4. Dry rock that is not stable.
5. Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than 4H:1V, but only if the material would otherwise be classified as Type B.

Type C - Cohesive soil with an unconfined compression strength of 0.5 tsf or less:

1. Granular soils including gravel, sand, and loamy sand.
2. Submerged soil or soil from which water is free-seeping.
3. Submerged rock that is not stable.
4. Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or steeper.

Unconfined Compressive Strength - The load per unit area at which a soil will fail in compression. It can be determined by laboratory testing or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

Wet Soil - Soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

3.0 REQUIREMENTS

Each soil and rock deposit shall be classified by a competent person as Stable Rock, Type A, Type B, or Type C. The classification of deposits shall be made based on the results of at least one visual and at least one manual analysis using the tests described in this appendix or in other recognized methods of soil classification and testing, such as those adopted by the American Society of Testing Materials.

In a layered system, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer.

If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the deposit shall be reclassified to reflect the changed conditions.

4.0 ACCEPTABLE VISUAL AND MANUAL TESTS

Visual Tests - Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open

excavation, and the soil taken as samples from excavated material.

1. Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.
2. Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.
3. Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.
4. Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures and to identify previously disturbed soil.
5. Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify whether the layers slope toward the excavation. Estimate the degree of slope of the layers.
6. Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.
7. Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

Manual Tests - Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

1. Plasticity - Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8 in. in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a 2 inch (50 mm) length of 1/8 inch thread can be held on one end without tearing, the soil is cohesive.
2. *Dry Strength* - If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand, or silt. If the dry soil breaks into clumps which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.
3. Thumb Penetration - The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual-Manual Procedure)."Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb and can be molded by light finger pressure. This test should be conducted on an undisturbed

soil sample, such as a large clump of soil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

4. Other Strength Tests - Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated Torvane shear device.

5. Drying Test - The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately 1 inch thick (2.54 cm) and 6 inches. (15.24 cm) in diameter until it is thoroughly dry:

   - If the sample develops cracks as it dries, significant fissures are indicated.
   - Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as a unfissured cohesive material and the unconfined compressive strength should be determined.
   - If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

Table B-1 Maximum Allowable Slopes

Soil or Rock Type	Maximum Allowable Slopes (H:V)[1] for Excavations Less Than 20 Feet Deep[3]	
Stable Rock	Vertical	(90°)
Type A[2]	3/4:1	(53°)
Type B	1:1	(45°)
Type C	1½:1	(34°)

Notes:

[1] Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

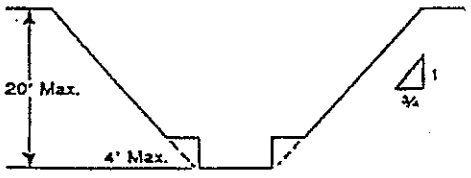
[2] A short-term maximum allowable slope of 1/2H:1V (53°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).

[3] Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Simple Slope—Short Term

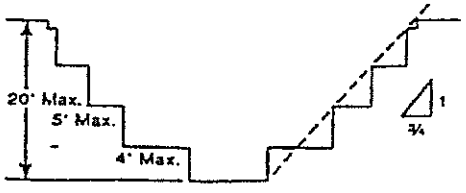
Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.



Simple Bench

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of ¾ to 1 and maximum bench dimensions as shown above.



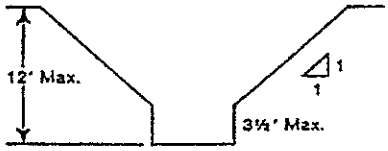
Multiple Bench

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet

Unsupported Vertically Sided Lower Portion—Maximum 8 Feet In Depth

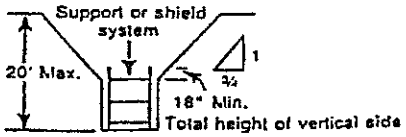
All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



Unsupported Vertically Sided Lower Portion—Maximum 12 Feet In Depth

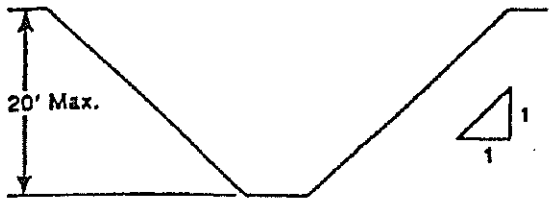
All excavations 20 feet or les in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.



Supported or Shielded Vertically Sided Lower Portion

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

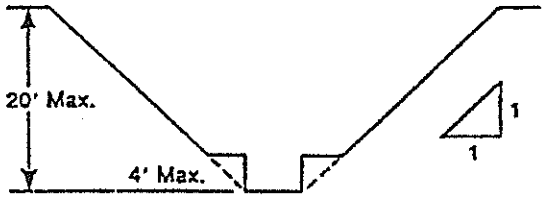
B—1.2 Excavations Made in Type B Soil



Simple Slope

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

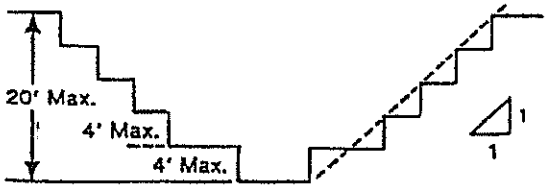
This bench allowed in cohesive soil only.



Single Bench

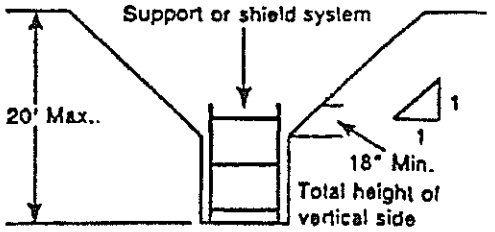
2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as shown above.

This bench allowed in cohesive soil only



Multiple Bench

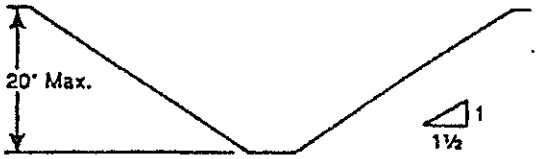
3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.



Vertically Sided Lower Portion

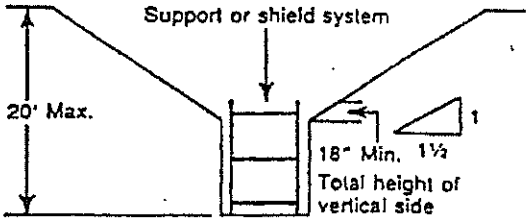
4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B—1.3 Excavations Made in Type C Soil



Simple Slope

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



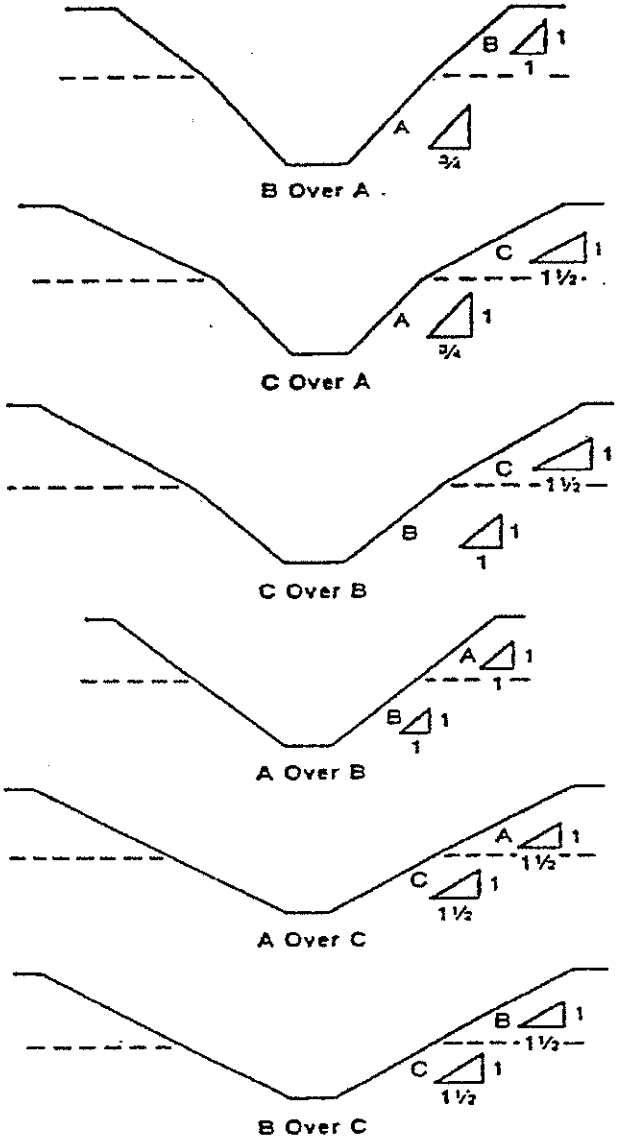
Vertical Sided Lower Portion

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B—1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.



2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

TABLE C-2.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P_a = 25 X H ± 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (S4S) AND SPACING OF MEMBERS **												
	CROSS BRACES							WALES		UPRIGHTS			
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN.)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)			
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	4	5	6	8
5 TO 10	UP TO 6	4X4	4X4	4X4	4X4	4X6	4	Not Req'd	Not Req'd				4X6	
	UP TO 8	4X4	4X4	4X4	4X6	4X6	4	Not Req'd	Not Req'd					4X8
	UP TO 10	4X6	4X6	4X6	6X6	6X6	4	8X8	4			4X6		
	UP TO 12	4X6	4X6	4X6	6X6	6X6	4	8X8	4				4X6	
10 TO 15	UP TO 6	4X4	4X4	4X4	6X6	6X6	4	Not Req'd	Not Req'd				4X10	
	UP TO 8	4X6	4X6	4X6	6X6	6X6	4	6X8	4		4X6			
	UP TO 10	6X6	6X6	6X6	6X6	6X6	4	8X8	4			4X8		
	UP TO 12	6X6	6X6	6X6	6X6	6X6	4	8X10	4		4X6		4X10	
15 TO 20	UP TO 6	6X6	6X6	6X6	6X6	6X6	4	6X8	4	3X6				
	UP TO 8	6X6	6X6	6X6	6X6	6X6	4	8X8	4	3X6	4X12			
	UP TO 10	6X6	6X6	6X6	6X6	6X8	4	8X10	4	3X6				
	UP TO 12	6X6	6X6	6X6	6X8	6X8	4	8X12	4	3X6	4X12			
OVER 20	SEE NOTE 1 [See 1926.652, Appendix C, paragraph (g)]													

* Douglas fir or equivalent with a bending strength not less than 1500 psi.

** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.3

TIMBER TRENCH SHORING --- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE C P_a = 80 X H + 72 psf (2 ft. Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS**												
	CROSS BRACES								UPRIGHTS				
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET) (See Note 2)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE				
5 TO 10	UP TO 6	6X8	6X8	6X8	8X8	8X8	5	8X10	5	2X6				
	UP TO 8	8X8	8X8	8X8	8X8	8X10	5	10X12	5	2X6				
	UP TO 10	8X10	8X10	8X10	8X10	10X10	5	12X12	5	2X6				
	See Note 1													
10 TO 15	UP TO 6	8X8	8X8	8X8	8X8	8X10	5	10X12	5	2X6				
	UP TO 8	8X10	8X10	8X10	8X10	10X10	5	12X12	5	2X6				
	See Note 1													
	See Note 1													
15 TO 20	UP TO 6	8X10	8X10	8X10	8X10	10X10	5	12X12	5	3X6				
	See Note 1													
	See Note 1													
	See Note 1													
OVER 20	SEE NOTE 1 [See 1926.652, Appendix C, paragraph (g)]													

* Mixed Oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may be substituted for wood.

TABLE C-1.1

TIMBER TRENCH SHORING -- MINIMUM TIMBER REQUIREMENTS *

SOIL TYPE A P_a = 25 X H + 72 psf (2 ft Surcharge)

DEPTH OF TRENCH (FEET)	SIZE (ACTUAL) AND SPACING OF MEMBERS **													
	CROSS BRACES						WALES		UPRIGHTS					
	HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)					VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	MAXIMUM ALLOWABLE HORIZONTAL SPACING (FEET)				
		UP TO 4	UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	4	5	6	8
5 TO 10	UP TO 6	4X4	4X4	4X6	6X6	6X6	4	Not Req'd	---				2X6	
	UP TO 8	4X4	4X4	4X6	6X6	6X6	4	Not Req'd	---					2X8
	UP TO 10	4X6	4X6	4X6	6X6	6X6	4	8X8	4			2X6		
	UP TO 12	4X6	4X6	6X6	6X6	6X6	4	8X8	4				2X6	
10 TO 15	UP TO 6	4X4	4X4	4X6	6X6	6X6	4	Not Req'd	---				3X8	
	UP TO 8	4X6	4X6	6X6	6X6	6X6	4	8X8	4		2X6			
	UP TO 10	6X6	6X6	6X6	6X8	6X8	4	8X10	4			2X6		
	UP TO 12	6X6	6X6	6X6	6X8	6X8	4	10X10	4				3X9	
15 TO 20	UP TO 6	6X6	6X6	6X6	6X8	6X8	4	6X8	4	3X6				
	UP TO 8	6X6	6X6	6X6	6X8	6X8	4	8X8	4	3X6				
	UP TO 10	8X8	8X8	8X8	8X8	8X10	4	8X10	4	3X6				
	UP TO 12	8X8	8X8	8X8	8X8	8X10	4	10X10	4	3X6				
OVER 20	SEE NOTE 1 [See 1926.652, Appendix C, paragraph (g)]													

* Mixed oak or equivalent with a bending strength not less than 850 psi.
** Manufactured members of equivalent strength may by substituted for wood.

TABLE D - 1.1
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE A

DEPTH OF TRENCH (FEET)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
OVER 10 UP TO 15	8				
OVER 15 UP TO 20	7				
OVER 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g) of Part 29 CFR 1926.652
Note (1): See Appendix D, Item (g) (1)
Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.2
ALUMINUM HYDRAULIC SHORING
VERTICAL SHORES
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	HYDRAULIC CYLINDERS				
	MAXIMUM HORIZONTAL SPACING (FEET)	MAXIMUM VERTICAL SPACING (FEET)	WIDTH OF TRENCH (FEET)		
			UP TO 8	OVER 8 UP TO 12	OVER 12 UP TO 15
OVER 5 UP TO 10	8	4	2 INCH DIAMETER	2 INCH DIAMETER NOTE (2)	3 INCH DIAMETER
OVER 10 UP TO 15	6.5				
OVER 15 UP TO 20	5.5				
OVER 20	NOTE (1)				

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g) of Part 29 CFR 1926.652
Note (1): See Appendix D, Item (g) (1)
Note (2): See Appendix D, Item (g) (2)

TABLE D - 1.3
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE B

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
			WIDTH OF TRENCH (FEET)						MAX.HORIZ.SPACING (ON CENTER)		
	VERTICAL SPACING (FEET)	* SECTION MODULUS (IN^3)	UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO15		SOLID SHEET	2 FT.	3 FT.
			HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10	4	3.5	8.0	2 IN	8.0	2 IN NOTE(2)	8.0	3 IN	—	—	3x12
		7.0	9.0	2 IN	9.0	2 IN NOTE(2)	9.0	3 IN			
		14.0	12.0	3 IN	12.0	3 IN	12.0	3 IN			
OVER 10 UP TO 15	4	3.5	6.0	2 IN	6.0	2 IN NOTE(2)	6.0	3 IN	—	3x12	—
		7.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 15 UP TO 20	4	3.5	5.5	2 IN	5.5	2 IN NOTE(2)	5.5	3 IN	3x12	—	—
		7.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
		14.0	9.0	3 IN	9.0	3 IN	9.0	3 IN			
OVER 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g) of Part 29 CFR 1926.652
Notes (1): See Appendix D, item (g) (1)
Notes (2): See Appendix D, Item (g) (2)
* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

TABLE D - 1.4
ALUMINUM HYDRAULIC SHORING
WALER SYSTEMS
FOR SOIL TYPE C

DEPTH OF TRENCH (FEET)	WALES		HYDRAULIC CYLINDERS						TIMBER UPRIGHTS		
			WIDTH OF TRENCH (FEET)						MAX.HORIZ SPACING (ON CENTER)		
	VERTICAL SPACING (FEET)	SECTION MODULUS (IN³)	UP TO 8		OVER 8 UP TO 12		OVER 12 UP TO 15		SOLID SHEET	2 FT.	3 FT.
			HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER	HORIZ. SPACING	CYLINDER DIAMETER			
OVER 5 UP TO 10	4	3.5	6.0	2 IN	6.0	2 IN NOTE(2)	6.0	3 IN	3x12	—	—
		7.0	6.5	2 IN	6.5	2 IN NOTE(2)	6.5	3 IN			
		14.0	10.0	3 IN	10.0	3 IN	10.0	3 IN			
OVER 10 UP TO 15	4	3.5	4.0	2 IN	4.0	2 IN NOTE(2)	4.0	3 IN	3x12	—	—
		7.0	5.5	3 IN	5.5	3 IN	5.5	3 IN			
		14.0	8.0	3 IN	8.0	3 IN	8.0	3 IN			
OVER 15 UP TO 20	4	3.5	3.5	2 IN	3.5	2 IN NOTE(2)	3.5	3 IN	3x12	—	—
		7.0	5.0	3 IN	5.0	3 IN	5.0	3 IN			
		14.0	6.0	3 IN	6.0	3 IN	6.0	3 IN			
OVER 20	NOTE (1)										

Footnotes to tables, and general notes on hydraulic shoring, are found in Appendix D, Item (g) of Part 29 CFR 1926.652
Notes (1): See Appendix D, item (g) (1)
Notes (2): See Appendix D, Item (g) (2)
* Consult product manufacturer and/or qualified engineer for Section Modulus of available wales.

EXCAVATION

■ 5/22/04 ■ Revision 0

EXCAVATION PERMIT /COMPETENT PERSON CHECKLIST

INSTRUCTIONS

1. Complete permit before excavation begins. 2) Post Permit/Competent Person Checklist and JSA at the job site until work is complete. 3) Send permit to safety office upon completion. Permits will be retained for 2 years.

Supervisor's Name:	**Jobsite:**
Permit Begins: Date: _____ Time: _____ AM/PM	**Permit Expires:** Date: _____ Time: _____ AM/PM
Location & Dimensions of excavation:	
Soil Type:	

Nature Of Work
Describe:

"I HEREBY ATTEST THAT THE FOLLOWING CONDITIONS EXISTED AND THAT THE FOLLOWING ITEMS WERE CHECKED OR REVIEWED DURING THIS INSPECTION"			
All open trenches being worked were inspected.	YES	NO	N/A
Preplanning for emergencies & trench rescue?	YES	NO	N/A
Were any tension cracks observed along top of any slopes?	YES	NO	N/A
Were slopes cut at design angle of repose?	YES	NO	N/A
Was any water seepage noted in trench walls or bottom?	YES	NO	N/A
Was there evidence of significant fracture planes in soil or rock?	YES	NO	N/A
Confined Space Entry Permit Required?	YES	NO	N/A
Underground Utilities / Piping Located & Flagged?	YES	NO	N/A
Were trench box(s) certified?	YES	NO	N/A
Was traffic in area adequately away from trenching operations with barricades?	YES	NO	N/A
Were hydraulic shores pumped to design pressure?	YES	NO	N/A
Was there any evidence of caving or sloughing of soil since the last field inspection?	YES	NO	N/A
Access and Egress provided	YES	NO	N/A
Atmospheric Testing	YES	NO	N/A
System Lockout/Tagout	YES	NO	N/A
Stability of Adjacent Structures	YES	NO	N/A
Exposure to Falling Loads Controlled? (material at least 2' from edge)	YES	NO	N/A
Protection from Water Accumulation	YES	NO	N/A
Was bracing system installed in accordance with design? (Shoring systems installed & maintained in accordance with manufacturer's instructions)	YES	NO	N/A

PROTECTIVE SYSTEM

Sloping and Benching — Option 1 2 3 4
What is the angle or slope ratio? _____

Support System (shoring) — Option 1 2 3 4

Shielding System — Option 1 2 3 4

Is the Excavation Barricaded? YES NO

ATMOSPHERIC TESTING (OXYGEN SAFE RANGE OF 20.5% TO 22 % REQUIRED) (COMBUSTIBLES < 10% LEL)

% Oxygen:	_____%	Test Time: _____
	_____%	Test Time: _____
	_____%	Test Time: _____
	_____%	Test Time: _____
Toxicity Test	_____PPM	Test Time: _____
	_____PPM	Test Time: _____
	_____PPM	Test Time: _____
	_____PPM	Test Time: _____
FLAMMABLES/ COMBUSTIBLE	_____LEL	Test Time: _____
	_____LEL	Test Time: _____
	_____LEL	Test Time: _____
	_____LEL	Test Time: _____
Other		

Emergency Services:

Identify

Method of Communication

Phone Number

Confined Space Permit Required	YES	NO			
Is Hot Work Permit Required?	YES	NO	If YES, Is it attached to this Permit?	YES	NO

SIGNATURE OF COMPETENT PERSON AUTHORIZING

Supervisor/Competent Person Signature: **Safety/Superintendent Signature:**	**Date:**	**Time:**

MOBILE EQUIPMENT SAFETY

■ 5/22/04 ■ Revision 0

1 PURPOSE AND SCOPE

This procedure provides the requirements for the safe operation of mobile equipment.

This procedure applies to all RC&D personnel and subcontractors working on projects where mobile equipment safety requirements are applicable.

2 REFERENCES

Code of Federal Regulations, Title 29, Part 1926, *Occupational Safety and Health Administration (OSHA),* U.S. Department of Labor.

3 APPENDIXES

- Appendix A, Equipment Inspection Forms
- Appendix B, Operator Qualification Record

4 GENERAL

■ Definitions

- *Heavy Equipment* - Mobile equipment used for or designed for earthmoving. Examples include crawler or wheel tractors, bulldozers, off-highway trucks, graders, loaders, agricultural and industrial tractors, and similar equipment. This definition does not include cranes or industrial trucks.
- *Industrial Trucks* - Mobile equipment, other than heavy equipment, used for lifting, carrying and stacking loads on the front of the vehicle. Examples include forklifts, stackers and similar equipment.
- *Mobile Equipment* - Self-propelled vehicles that operate within an off-highway jobsite, not open to public traffic.

■ Responsibilities

- The *Manager/Supervisor* is responsible for ensuring that equipment is in serviceable condition and competently manned to afford safe operation at all times. The Manager/Supervisor is responsible for implementing and enforcing this procedure.
- The *Safety Representative* is responsible for overseeing the use of mobile equipment at the site, conducting inspections, reporting deficiencies, and monitoring compliance with this procedure.
- *Subcontractors* are responsible for providing all necessary documentation of inspections for the previous year for any mobile equipment brought to the site and certifying that the equipment meets applicable OSHA standards and this program. Subcontractor operators shall provide documentation of mobile equipment operation training or other documentation acceptable to the Safety Representative.

5 PROCEDURE

■ Safety Inspection and Maintenance

- The operator shall perform a documented inspection on vehicles or equipment daily prior to use and report any unsafe conditions. Unsafe conditions shall take the vehicles or

equipment out of service until corrected.

- Fire extinguishers shall be placed on all vehicles or equipment and inspected monthly. Monthly inspection and service records will be filed in the project office.
- All safety items on vehicles and equipment shall be inspected and serviced regularly by a qualified mechanic, either on or off the project site.

  These items include but not limited to:

  Vehicles

  Adequate vision (mirrors, windshield, etc.), windshield wipers, and blades
  Brakes - including emergency brakes
  Fan belts
  Headlights
  Tail lights
  Brake lights
  Signal lights
  Hydraulic lifts
  Power steering
  Tires - including spare
  Adequate jacks and lug wrench
  Horn
  Air equipment
  Seat belts

  Equipment

  Adequate vision (mirrors, windshields, etc.)
  Windshield wipers and blades
  Horn or warning bell (as required)
  Air equipment
  Lights - front, rear, stop, boom, etc.
  Emergency brakes, including winch brakes, etc.
  Generator, starter, etc.
  Booms, welds, bolts, etc.
  Hydraulic hoses, couplings, pumps
  Fan belts

■ Operation of Vehicles

- Only qualified, licensed operators shall operate company-owned, leased, or rented vehicles.
- All operators shall be required to obey all city, county, or state motor vehicle laws.
- City, county, or state safety inspection of vehicles, when required, shall be obtained and decals posted on vehicles.
- Company-owned or -leased equipment shall not be used off the project except for company business or as approved by senior management.
- Persons not employed by the company shall not operate company owned, leased, or rented equipment unless authorized by the Manager/ Supervisor.
- Equipment shall not be driven into unsafe areas of construction where unnecessary tire, steering, or body damage could result.
- Personnel shall not be allowed to ride on running boards or tailgates, or allow parts of body to protrude from vehicle or equipment.

■ Operating Safety Procedures

- Vehicles or equipment used to transport explosives, gasoline, fuel oils, or other flammable or combustible material shall not haul passengers.
- Smoking will not be allowed on, in or within 50 ft of vehicles hauling fuel oils, gasoline, diesel fuel, or explosives.
- Over-the-road vehicles that are required to keep Interstate Commerce Commission (ICC) logs shall do so per ICC regulations.
- Use of alcoholic beverages, drugs, (including No-Doz and No-Sleep tablets) shall not be tolerated while operating company-owned, -leased, or -rented vehicles.
- All vehicles/equipment transporting material shall comply with city, county, or state laws pertaining to weight, height, length, and width. Permits are mandatory if required by city, county, or state.

■ **Operation of Equipment**

- Only qualified personnel shall be allowed to operate company-owned, -leased, or -rented equipment.
- The operator shall be personally responsible for the safe movement and/or operation of equipment.
- No equipment shall be operated beyond its safe load or operational limits.
- Personnel shall not be allowed to ride on equipment, including loads, headache ball, fenders, etc.
- Operators loading and/or unloading equipment or material from vehicles with drivers shall be responsible that drivers step out of vehicles to a safe area.
- Operators using flaggers shall ensure that flaggers are seen, understand signals prior to moving equipment, and are aware of overhead structures, electrical lines, etc.
- Equipment operated on city, county, state, or federal property or roads shall comply with laws governing operations. Permits that are required shall be mandatory.
- Hoist chains shall be visually inspected daily for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

■ **Accidents Involving Vehicles or Equipment**

- All accidents involving company-owned, -leased, or -rented vehicles or equipment shall be investigated and reported on insurance forms.
- A narrative report of accidents and estimates of damage shall be mandatory for all accidents. This report will be forwarded to the Corporate Environmental, Safety & Health (EH&S) Office and the Manager.
- Operators of vehicle(s) or equipment

shall be responsible for reporting accidents to supervisors.

- Any vehicle(s) or equipment involved in an accident shall not be used until inspected and approved for service by a qualified mechanic.
- Reports of an accident required by city, county, or state laws shall be mandatory.
- Reporting of accidents on or off the site to the Corporate Safety Office shall be mandatory.
- When city, county, or state police investigate an accident, a copy of the report shall be obtained and forwarded with the insurance report to the Corporate Safety Office.

NOTE: All accidents involving subcontractor vehicles or equipment shall be investigated and a written report shall be sent to the Corporate EH&S Office and the Manager/ Supervisor.

■ **Subcontractor Vehicles and Equipment**

- Subcontractor employees shall follow this procedure for the operation, inspection, and maintenance of vehicles and equipment.
- All RC&D supervisors shall visually inspect and observe the vehicles and equipment of subcontractors and stop any unsafe condition or practices. Equipment not in compliance with applicable safety standards shall not be permitted to operate.

Speeding is a major hazard. Work areas are congested, and every person operating a vehicle shall drive at a reasonable and prudent speed considering the conditions.

Equipment Inspection Report

Equip.#_____ Job#_____ Date_____
Make/Model_____ Hours_____

"G" new or good condition; "F' fair or serviceable condition; "R" needs repair, "N' item not applicable:

GENERAL
___Body
___Cab
___Fire Extinguisher
___Safety Glass
___Angle Ind.
___Load Ind.
___Load Charts
___Proximity Signs
___Signal Charts
___Turntable Mtg.
___Counterweight
___Backup Alarm
___Horns
___Cont. Panel Gauges
___Windshield Wipers
___Upholstery
___Lubrication

ENGINE & TRANS.
___Oil Level Cond.
___Oil Leaks
___Operating Cond.
___Cooling Sys./Hoses
___Water Level Anti Free
___Battery Cond.
___Belts/Fan/Alt.
___Trans. Level Cond
___U-Jnts. - Hyd.Pump
___Fan Hub/Grd.Cond.
___Exhaust Sys.
___Air System
___Air pressure
___Air sys.
___Guards in position

UPPER WORKS
___Boom Hoist Cyl.
___Boom Hoist Cyl. Mtg
___Structure
___Swing Motor
___Swing Brakes
___Main Hoist Flg.
___Aux. Hoist Flg.
___Main Hoist Brakes
___Aux. Hoist Brakes
___Control Operator
___Boom Hoist Cable

HYDRAULIC SYSTEM
___Hoses
___Lines
___Pumps
___Motors
___Fittings
___Hyd. Fluid Level
___Leakage

CARRIER
___Tire Lug/Trak Cond.
___Tire Condition
___Tire Pressure
___Brakes
___Steering
___Outriggers
___Outrigger bushing
___Power steer/bushing ___Lighting Sys.
___Structure
___Hyd. Tag Reel
___Telescope Cyl
___Telescope Section
___Pt. Sheaves Lub.
___Pt. Sheaves Cond.
___Load Block Cond.
___Load Bk. Capacity
___Hook Condition
___Hook Safety Latch
___Jib Condition
___Jib Sh. Axle Lubed
___Sheave Guards
___Reeving
___Rope Sockets
___Cable Clamps
___Wedge Socket
___Dead-End Connect

WIRE ROPE
___Jib Pendants
___Load Line
___Whip Line

Remarks:
Inspection By:_____ Date_____

Equipment Inspection Report

☐ Quarterly ☐Incoming ☐Annual ☐Correction of Deficiencies ☐Audit

Mark each box with "G" new or good condition; "F' fair or serviceable condition; "R" needs repair, "N' item not applicable:

Make:_____ Model:_____ Serial No.:_____

Capacity:_____ Eng.Hours:_____ Owner:_____

General:	G	F	R	N/A
Lubrication				
Access covers/guard				
Fire extinguisher				
Non-slip surface				
Capacity markings				
Warning signs				

UPPER WORKS:	G	F	R	N/A
Safety locks				
Boom/cylinders				
Dipper/cylinders				
Bucket/connections				
Bucket/cylinder				
Boom swing				
Telescoping				
Front bucket/blade				
Blade cylinders				
Bushings/pins/keepers				
Hooks/eyes				
Auxillary attachments				
Winch				
Wire rope				

HYDRAULIC SYSTEM	G	F	R	N/A
Oil leak/leaks				
Hoses/piping				

CAB:	G	F	R	N/A
Operator's manual				
Controls/labels				
Steering/travel				
Load chart				
Guages				
Lights				
Horn/alarms				
Windows/wipers				
Heater/fan				
Brakes				
Roll protection				
Control/safety hooks				
Frame/weldments				
Outrigger pads				
Arm rest				
Drive motors				
Tires/tracks				
Seat belt				
Rollers/idlers				

ENGINE:	G	F	R	N/A
Leaks				
Battery/anchorage				
Muffler/exhaust				
Belts				
Cooling system				

Remarks:

Inspectors:_____ Date:_____

☐ Tagged Out ☐Awaiting Repairs ☐Returned to Vendor

MOBILE EQUIPMENT SAFETY

■ 5/22/05 ■ Revision 0

Operator Qualification Record

Name:_____

Drivers License No:_____

Type Equipment	Years Experience
_____	_____
_____	_____
_____	_____
_____	_____

License Required (Y/N)? _____

Copy of License Provided (Y/N)? _____

_____ _____
Operator's Signature Date

_____ _____
Designated by Date

TOOL SAFETY

■ 5/22/05 ■ Revision 0

■ PURPOSE AND SCOPE

This procedure provides the guidelines for the proper use and maintenance of power tool guards to eliminate hazards relative to points of operation, nip points, rotating parts, flying chips, and sparks.

This procedure applies to all RC&D personnel and subcontractors working on projects where tool safety requirements are applicable.

2 REFERENCES

- American National Standards Institute (ANSI) B7.1-1988, Safety-Requirements for the Use, Care, and Protection of Abrasive Tools.
- Title 29, Code of Federal Regulations, Parts 1910 and 1926, *Occupational Safety and Health Administration* (OSHA), U.S. Department of Labor.

3 APPENDIXES

None

4 GENERAL

Power tools designed to accommodate guards shall be equipped with these guards when in use. The guarding device shall conform to applicable standards, or in the absence of such standards, shall be designed and constructed to prevent the operator from having any body parts susceptibility to injury. All power tools shall be equipped with a constant pressure switch that will shut off the power when the pressure is released.

■ Definitions

- *Flange* - A collar, disc, or plate between or against which wheels are mounted and are referred to as adapt or sleeve, straight relieved, or straight unrelieved type. The flange disseminates the driving torque of the spindle to the grinding wheel and assists in maintaining the integrity of the wheel.
- *Cup Wheels* (Types 6 and 11) - Wheel types which have been numerically designated by ANSI, utilizing grinding wheel design as criteria. Types 6 and 11 are of cup wheel design.

■ Responsibilities

- The *Manager/Supervisor* is responsible for implementing and enforcing this procedure.
- The *Safety Representative* is responsible for monitoring compliance with this procedure.

5 PROCEDURE

■ Electrical Tools

All electrical tools shall be provided electrical service through ground fault circuit interrupters and an assured grounding system to protect employees from electrical shock due to a tool defect.

■ Grinding Tools

- Grinding Wheels

  Guards for portable abrasive wheels used for external grinding shall be so mounted as to maintain proper alignment with the wheel, and the guard and its fastenings shall be of sufficient strength to retain fragments of the wheel in case of accidental breakage. Guards are not mandatory for wheels used for internal work while within the work being ground nor on wheels 2 inches or less in diameter which are securely mounted on the end of a steel mandrel.

  General precautions when using flanges follow:

  — Ensure both flanges are of equal diameter.

  — Do not use washers in place of flanges.

  — Ensure flanges have proper clearance or relief.

  — Do not overtighten flanges causing them to bend.

  — Clean all dirt and foreign material from sides of wheels and flanges.

  — Check that flange diameter is no less than 1/3 wheel diameter and is preferably made of mild steel.

  Information regarding specific types of flanges can be referenced in ANSI Standard B7.1-1988.

- Cup Wheels

  Cup wheels (Types 6 and 11) shall be protected by fixed guards which mount behind the wheel and are attached to the housing of the grinder. The guard shall enclose the wheel sides downward in accordance with ANSI Standard B.7-1-1988.

- Vertical Portable Grinders

  Safety guards used on machines known as right angle head or vertical portable grinders shall have a maximum exposure angle of 180 degrees, and the guard shall be so located as to be between the operator and the wheel during use.

- Other Portable Grinders

  The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed 180 degrees, and the top half of the wheel shall be enclosed at all times.

- Adjusting Safety Guards Peripheral protecting members can be adjusted to the constantly decreasing diameter of the wheel by means of an adjustable tongue or similar device. The maximum distance between the wheel periphery and the torque or end of the peripheral band at the top of the opening shall not exceed 1/4 inch. Immediately after mounting the wheel and before turning on the power, the operator should turn the wheel by hand for a few revolutions to see that it revolves properly.

■ Portable Belt Sanding Machines

Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall prevent the hands and fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall also be guarded against accidental contact.

■ Portable Circular Saws

All portable, power-driven circular saws having a blade diameter greater than 2 inches shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

■ Portable Band Saws

Guards shall be provided at each pulley and extend along the non-cutting portion of the band saw. Because a guard is not feasible along the cutting portion, proper hand position is imperative. Both hands are necessary to handle this type saw, and should be placed into the corresponding handles.

■ Other Tools

Tools such as electric drills, saber saws, and portable routers are not compatible with guards due to their physical characteristics in conjunction with their function. Therefore, proper usage, with special emphasis on hand position, is the primary accident-preventive measure.

■ Pneumatic Tools

- A tool retainer shall be installed on each piece of equipment, which, without such a retainer, may eject the tool. The hose and hose connections used for conducting compressed air to pneumatic equipment shall be designed for the pressure and service to which they are subjected. The hose shall be secured to the power tool by some positive means to prevent the hose from becoming accidentally disconnected. Hose connections shall be secured with a pin or wire. All hoses exceeding 1/2 inch inside diameter shall have a safety device at the source of supply or branch line to reduce pressure in case of hose

failure.

All pneumatically driven nailers, staplers, and other similar equipment provided with an automatic fastener feed, which operates at more than 100-psi pressure at the tool, shall have a safety device on the muzzle, to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface.

- Airless spray guns of the type which atomize paints and fluids at high pressures (1,000 psi or more) shall be equipped with automatic or visible manual safety devices which will prevent pulling of the trigger to prevent release of the paint or fluid until the safety device is manually released. In lieu of the above, a diffuser nut which will prevent high pressure, high velocity release, while the nozzle tip is removed, plus a nozzle tip guard which will prevent the tip from coming into contact with the operator, or other equivalent protection, shall be provided.
- Pneumatic powered drills and grinders shall be guarded in the same manner as those powered by electricity.
- Tampers shall be equipped with hand guards to protect employees when working close to walls or other fixed objects or structures.

Gas Welding and Burning Equipment

All gas welding and burning equipment shall be provided with flash back arrestors to preclude the possibility of an ignition of gas within the hose, thus creating an explosion hazard within the gas cylinder.

Training and Maintenance

For a tool guarding procedure to be effective, employees must be educated as to why guards are necessary and trained in how to properly use whatever guards are needed. These precautionary measures along with periodic reminders must be taken in order to expect employees to respect the value of machine guarding. Follow-up measures in the form of proper supervision, regular inspections, and accident investigations are necessary to assure that machine guarding regulations and practices are in compliance.